USER'S MANUAL

JVF-2000-10 ANG

VARIABLE FREQUENCY ELEVATOR CONTROLLER

CJ1M PROCESSOR
VARIABLE SPEED DRIVE
MAGNETEK HPV OR CONTROL TECHNIQUES SP / M

JVF-2000 SERIES
CODE B44-10

VERSION
JVF-2000_HPV/CT_A_10-5.0

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NOTES AND PRECAUTIONS

- The controller must be installed by competent people who possess the suitable training and cards for the installation of elevator controllers;
- The controller's power supply must come from a fuse switch supplied by others. The fuses value must respect the electrical code;
- It is necessary to install a separate conductive element to ground the controller in the mechanical room. To know the size of the conductive element, check the electrical code. An indirect grounding (e.g. water pipes) may cause intermittent troubles and electrical noises may occur;
- Please note the controller comes with a one (1) year guarantee, effective on the day of billing. An improper use of the controller, an incorrect connection or the disregard of the user's manual may void the guarantee. Also note that only the components are guaranteed;
- In case of an incorrect connection, the controller is protected by TVS which can short-circuit. Verify the functioning and replace them if needed.
- Allow enough space between the resistor bank, located on top of the controller, and the machine room ceiling for the dynamic braking resistor may be from 4,000 to 30,000 watts (see drawings).

Operating conditions:

- The 3 phases entry voltage may vary of more or less 10 %;
- A 60HZ frequency is standard, a 50HZ frequency is available on special order;
- The operating temperature is 0 to 45°C;
- The relative humidity is 95 %;
- Do not install the NEMA 1 standard enclosure in a dusty environment or where there is risk of water infiltration. Other types of enclosures are available upon request (NEMA 4, 12 etc.);
- Please contact Automatisation JRT Inc. if the motor is installed at 50 ft. or more from the controller;
- CSA approval.

General information:

JVF-2000 series controllers were developed for a quick and easy installation and operation. The controllers have functions of internal self-diagnosis, which allow an easy maintenance. There are also several functions that are programmable by the user.

Thus, it is very important to read thoroughly the manual, for a quick and secure installation. Please note that this controller cannot operate without an encoder.

There are two ways to program the controller options. The first option is the LCD screen installed inside the controller. It allows configuring the elevator but you cannot modify the plc's program if a sequence modification is required. The second option is the programming console (CQM1-PRO01-E or C200H-PRO27). This option allows programming of the plc if a sequence modification is required. The second option is not necessary for the elevator start-up.

General features:

- Number of floors: 64
- Maximum number of cars: 12

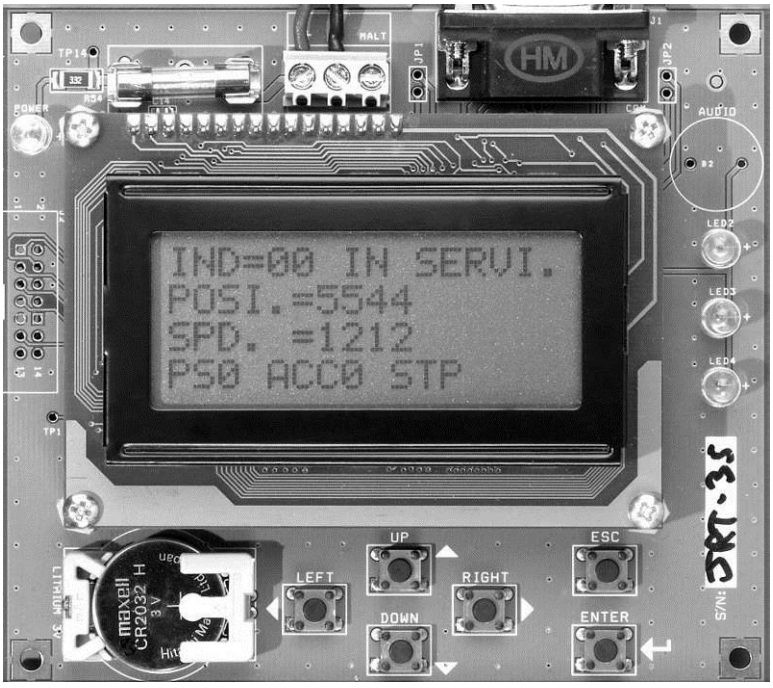
1. LCD USE (JRT-LCD):

This section is a summary of the supervision utility. ***Refer to appendix C for a complete description.***

The LCD lets you visualize the state of the elevator controller (floor, speed in FPM, perforated tape position, alarms, etc.), modify the plc's configuration registers and also to record car calls and hall calls from a distance. The utility offers the possibility to have the information displayed in French or English.

The utility is provided with different light-emitting diodes "LED". The "POWER" LED indicates that the utility is power supplied. The "LED2" blinks to indicate that the program is functioning normally. Though, if the "LED2" stays on or off at all times, the program is not in an operational, you must reset the power.

When the elevator is in trouble, the screen of the "LCD" utility will blink to warn the user.



1.1. Keyboard:

The "UP/DOWN" keys allow access to the main menus or sub-menus. They also allow changing the value of a parameter.

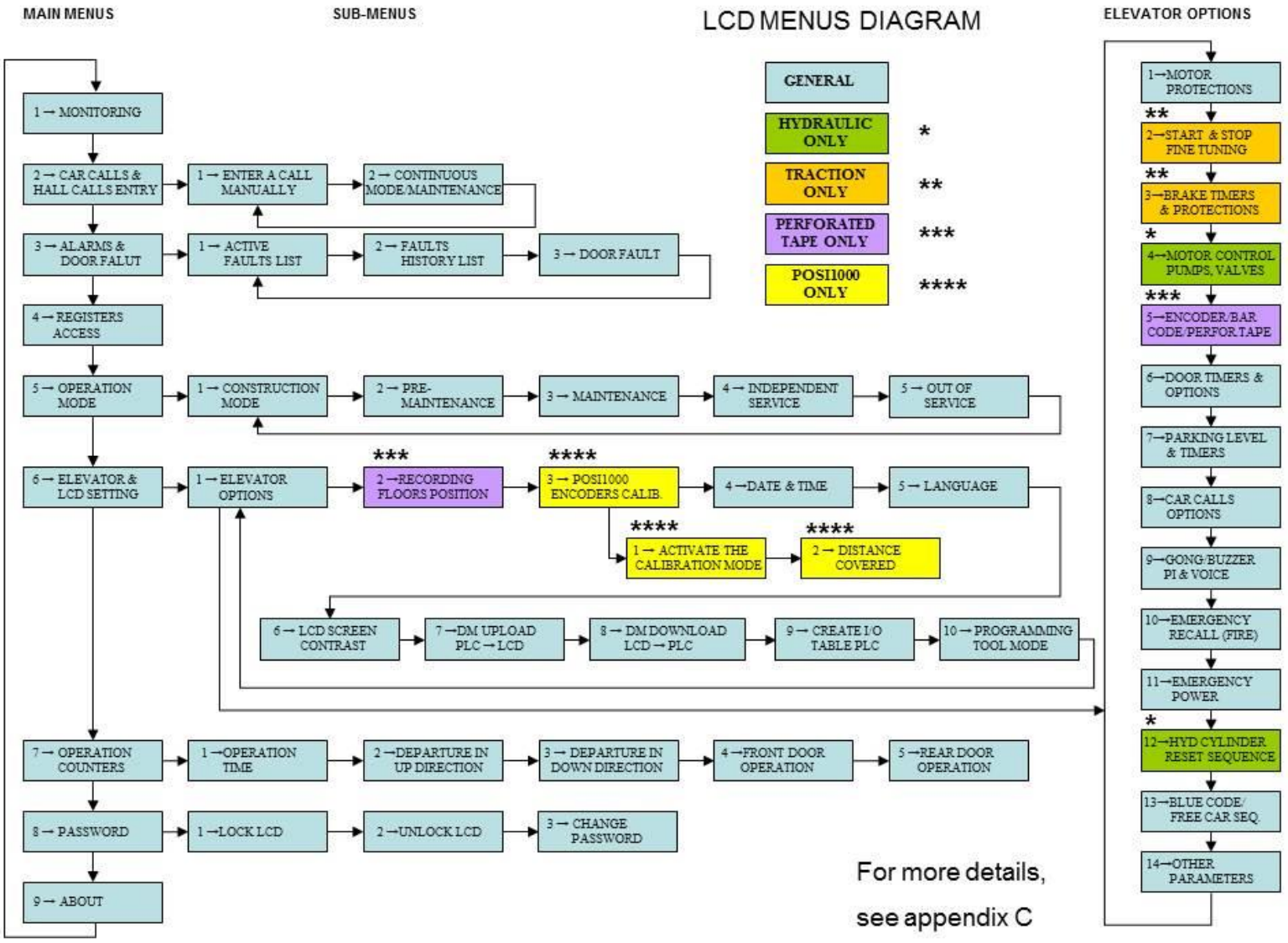
The "LEFT/RIGHT" keys allow placing the cursor on the parameter to modify.

The "ENTER" key allows access to a sub-menu. It also allows saving of a new value.

The "ESC" allows to return to the main menus or to cancel a parameter modification.

1.2. Menus:

The "LCD" utility contains differents menus available to the users.



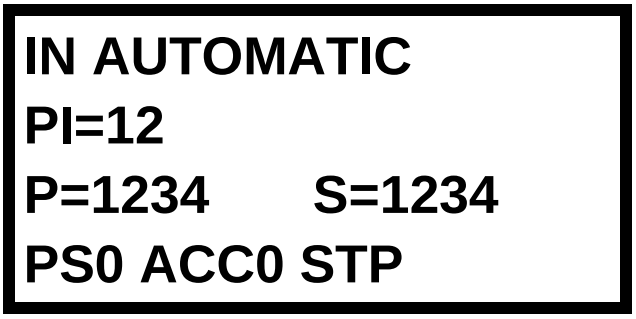
<u>To access a menu:</u>

- Press "ESC" to access to the menus list.
- Press on the "UP/DOWN" keys to select a menu.
- Press "ENTER" to access the menu.

The "LCD" utility has a protection that locks the menus where it is possible to modify a value or a parameter. In order to access to these menus, the user must enter the password. See section "1.2.7 Password Menu" (The LCD is locked after three hours of inactivity).

1.2.1. Monitoring menu:

The "Monitoring" menu shows, in actual time, the elevator's status data. This information may be used during the temporary and final start-up. At a start-up or after 2 hours of keyboard inactivity, the following screen will appear:



Presented informations:

- PI. = Floor where the elevator is located.
- AUTOMATIC = Actual status of the elevator (See next page for the complete list).
- POSI. = Actual position of the perforated tape (only if the controller has a perforated tape).
- SPD. = Elevator actual speed in FPM (only if the controller has perforated tape).
- If the elevator is traction, the last line is for the drive.

➢ PSX = Preset speed X. PS0 = Preset speed 0 (see the drawings at the drive page).

➢ ACCX = Accel or decel X. ACC1 = Accel 1 (see the drawings at the drive page).

➢ FOW = Forward, REV = Reverse, STP = Stop.

- If "Soft-Start", the last line is for the "Soft-Start":

➢ STOP = The elevator don't moves.

➢ RUN = The elevator is moving.

➢ Up to speed = The elevator reach the maximum speed.

If there is more than one status in the PLC, the "LCD" will display at the second all the status.

When the elevator controller is in floor position upload cycle, the "LCD" displays "DM483" at the position "PI.=". It is possible to see if the number of door zone magnets (DZO) is the same as the number of floors.

1.2.2. Register Access menu:

This menu allows reading and writing in one of the PLC's register. The "DM" registers are used to configure the elevator.

- Press "ESC" to go back to the previous menu.
- Press "UP/DOWN" keys to select the main menu "REGISTERS ACCES".
- Press "ENTER".

Register type selection:

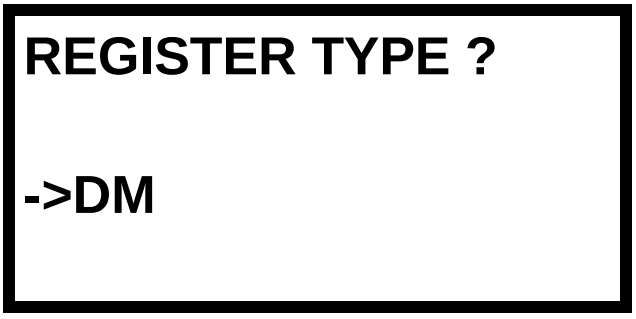
- Press "UP/DOWN" to select a register.
- Press "ENTER" to save.

or

- Press "ESC" to go back to the previous menu.

Choice of registers:

- DM, CH, HR and AR (for CJ1M PLC).



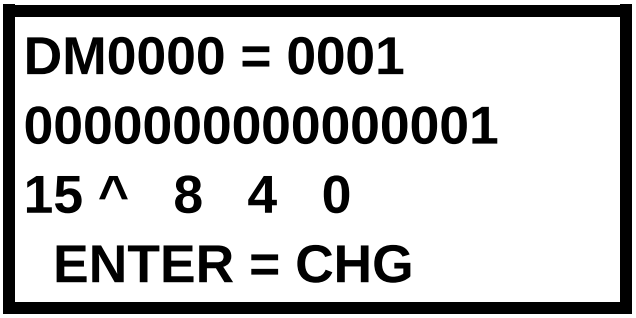
Register number selection:

- Press on the "LEFT/RIGHT" keys to place the cursor on the number to modify.
- Press on the "UP/DOWN" keys to modify the number.
- Press "ENTER" to save and to go to the next menu.
- Press "ESC" to go back to the previous menu.

Register Value:

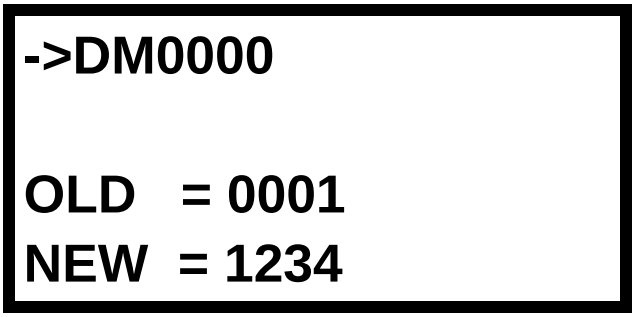
The register value is shown in hexadecimal and binary formats.

- Press "ENTER" to modify the selected register value.
- Press "ESC" to go back to the previous menu.



Modifying the register value:

- Press on the "LEFT/RIGHT" keys to place the cursor on the number to modify.
- Press on the "UP/DOWN" to modify the number.
- Press "ENTER" to save and to go back to the previous menu and visualize de new value.
- Press "ESC" to return to the previous menu.



1.2.3. Active faults list menu:

This menu allows visualising the different alarms in the elevator controller. The utility "LCD" displays "NO ALARM" when the elevator controller has no more alarms. Press on the "UP/DOWN" keys to scroll the alarms.

Visualizing the alarms:

- Press "ESC" to return to the previous menu.
- Press "UP/DOWN" keys to select the main menu "ALARMS & CPU I/O CHECKING".
- Press "ENTER".
- Press "UP/DOWN" keys to select the sub menu "ACTIVE FAULTS LIST".
- Press "ENTER".

To erase the alarms:

- Press the "ENTER" keys, the LCD will shows an other windows to make a confirmation.

1.2.4. Construction mode menu:

The Construction mode disables temporarily certain detections to facilitate the elevator car construction in Inspection mode. As soon as the elevator controller is placed in Automatic mode and that a call has been placed, the Construction mode will be deactivated automatically and all signals will be in function.

The elevator controller must be in Inspection mode.

- Press "ESC" to return to the previous menu.
- Press "UP/DOWN" keys to select the main menu "OPERATION MODE".
- Press "ENTER".
- Press "UP/DOWN" keys to select the sub menu "CONSTRUCTION MODE".

- Press "ENTER".

- Press "UP" to activate the Construction mode.

1.2.5. Recording floor position menu:

This menu allows launching a function that registers floors when the controller uses a perforated tape or an encoder on the governor for the floor positioning. Refer to section 6.

The elevator controller must be in Inspection mode.

- Press "ESC" to return to the previous menu.

- Press "UP/DOWN" keys to select the main menu "ELEVATOR & LCD SETTINGS".

- Press "ENTER".

- Press "UP/DOWN" keys to select the sub menu "RECORDING FLOORS POSITION".

- Press "ENTER".

- Press "UP" to activate.

When the elevator controller is in a floor position registering cycle, the "LCD" utility displays what is in "DM483" where is says "IND=" on the screen. It is impossible to know if the number of magnets, door zone (DZO), is the same than the number of floors.

1.2.6. Elevator options menu:

This section contains all elevator control parameters. The parameters are separated by sections. Some sections will be hidden according to the controller type and option. **Refer to appendix C for a complete description.**

- Press "ESC" to return to the previous menu.

- Press "UP/DOWN" keys to select the main menu "ELEVATOR & LCD SETTINGS".

- Press "ENTER".

- Press "UP/DOWN" keys to select the sub menu "ELEVATOR OPTIONS";

- Press "ENTER".

- Press "UP/DOWN" keys to select the good option menu.

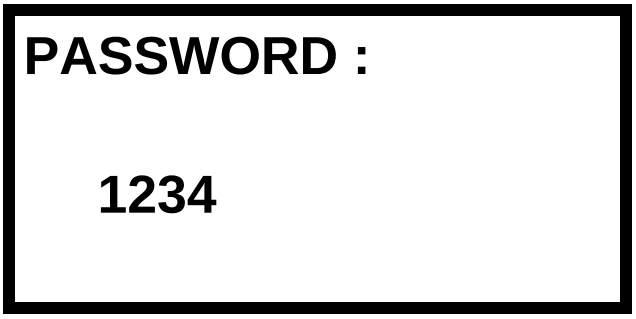
- Press "ENTER".
- Press "UP/DOWN" keys to select the good parameter.

To modify an option:

- Press on "LEFT/RIGHT" keys to edit the parameter.
- Press on "LEFT/RIGHT" keys to change the digit to modify.
- Press on "UP/DOWN" keys to change the number.
- Press on "ENTER" to save the new value and exit edition mode.
- Press on "ESC" key to exit without saving.
- Repeat for all parameters that you want to change.

1.2.7. Password menu:

This menu allows entering a password to unlock the parameters modification menus. The password is "1234". After 2 hours of keyboard inactivity, the "LCD" utility will be locked again.



- Press "ESC" to return to the previous menu.
- Press "UP/DOWN" keys to select the main menu "PASSWORD".
- Press "ENTER".

Entering the password:

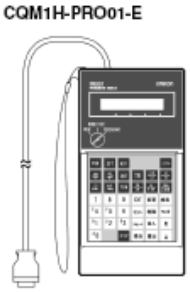
- Press on the "LEFT/RIGHT" keys to place the cursor on the number to modify.
- Press on the "UP/DOWN" keys to modify the number.
- Press "ENTER" to save.

or

- Press "ESC" to return to the previous menu.

2. USE OF THE PROGRAMMING CONSOLE (PRO01 OR PRO27):

The programming console, as the LCD utility, allows access to the visualisation and modification registers. It is also possible, under the supervision of Automatisation JRT Inc., to modify or add a programming sequence.



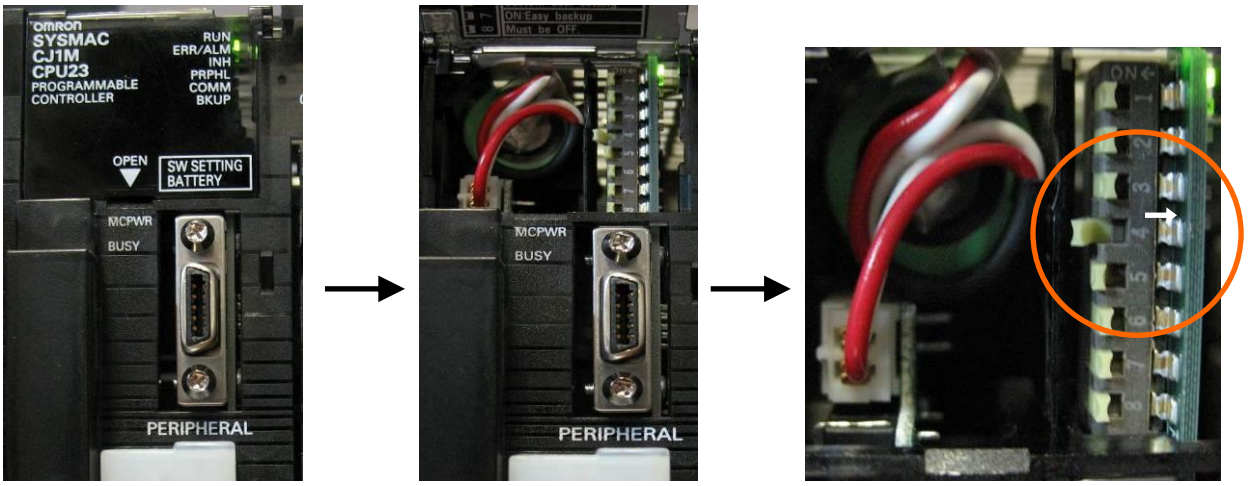
2.1. Programming console connection:

The programming console is connected on the peripheral port "PERIPHERAL" of the PLC. Always leave the key on the console in "MONITOR" mode.

For example if the peripheral port is already used by the LDC supervision, do not forget to reconnect it once it’s done. The switches must also be put back as they were.

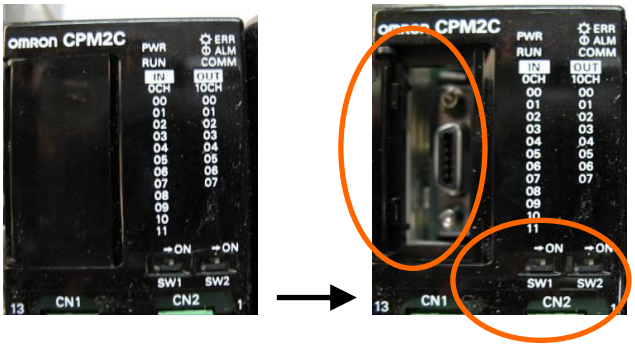
2.1.1. On the CJ1M PLC:

Open the "SW SETTING AND BATTERY" door located on top of the communication port and put the switch "4" at "OFF". The console will only display hyphens if the switch"4" is not "OFF" (RIGHT).



2.1.2. On the CPM2C PLC:

Open the door on top of the "CN1" connector to access the communication port. Put the switches "SW1" and "SW2" at "OFF".



2.2. Visualising and modifying a DM (elevator configuration):

For example, to access register 492, you must do as followed:

- CLR → MONTR → 3
- DM → 492 → MONTR

Screen = | **DM492** 0000 |

To modify a register, do as followed:

- CHG → 1234 → WRITE

Screen = | **DM492** 1234 |

To return to the beginning:

- CLR → CLR

2.3. Consulting the alarms:

- CLR → MONTR → 3
- SHIFT → CH/*DM → HR → 80 → MONTR → SHIFT → MONTR

Screen = | **HR80** **0000000001000000** **Bit15 Bit0** |

- Thus, only the HR8006 alarm is activated. Do ↓ to visualise le HR81:

Screen = | **HR81** **0000010010000000** **Bit15 Bit0** |

- Thus, HR8107 are HR8110 are activated.
- Do ↓ to see the other registers.

REFER TO SECTION 14.5 FOR THE ALARMS DESCRIPTION.

3. TEMPORARY START-UP:

A. Install jumpers between the following terminals:

- "J0" and "J1" (governor and emergency brake circuit);
- "J1" and "GOV" (governor and emergency brake circuit) ;
- "J1" and "J6" (top of car);
- "J1" and "J7" (hoistway access line);
- "J7" and "J9" if there is no car top inspection box;
- "J9" and "J10" (car stop) and special emergency stop, PH2;
- "J10" and "LNH" (normal up limit);
- "J10" and "LNB" (normal down limit);
- "J9" and "PP" (hall doors closed);
- "J9" and "PC" (car door closed);
- "J9" and "HDL" (hall doors locked if manual doors or motorised cam);
- "PCH" and "LTT" (Top landing inspection limit).
- « ISR » and « ISR1 » (in car inspection key switch).

208-460-600 volts controller without isolation transformer:

Connect the main power supply with the main switch has indicated in the drawings.

For the first time, remove the 3 fuses and measure the voltage.

208-460-600 volts controller with isolation transformer:

Supply the drive power section with the isolation transformer using the appropriate primary and secondary connections as specified in the drawings at chapter 7, section 7.1.1 for the Magnetek HPV drive and at chapter 8, section 8.1.1 for the Control Techniques drive. Another line must power the controller.

Put "XO" terminal to ground.

For the first time, remove the 3 fuses and measure the voltage.

B. Connect the motor, the encoder and the temperature sensor as specified at chapter 7, section 7.1 for the Magnetek HPV drive and at chapter 8, section 8.1 for the Control Techniques drive.

Provide a copper conductor for the electrical grounding of the motor.

C. The variable speed drive has its own internal electronic overload protection. It will adjust itself with the motor current parameters.

D. Measure:

- Controller power voltage (see drawings)
- 120 volts AC between "J" and "N", "JC" and "N".
- 24 VDC between "+A" and "COM", "+AC" and "COM", "+GR" and "COM", ("+DC" and "COM") (internal voltage), "+24V" and "COM" (tape selector or governor encoder voltage).

E. The PLC "POWER" and "RUN" green lights must be on at all time.

F. To move in inspection mode:

Controller inspection:

Put the hall and car doors derivation switches at the position "OFF".

Put a jumper between the terminals +A" and "ISR". Put the inspection switch at the position “INSPECTION”. Press on the buttons “UP” or “DOWN” of the “JRT-INT-02” card to move the elevator.

Top of the car inspection or remote control:

Do not connect the terminal "ISR". The signal corresponding to “ISR” must be turned off. Connect the button “UP” and “DOWN” with your remote between the terminals “+A” and “PCH” and “+A” and “PCB”.

G. CONSTRUCTION MODE:

The "construction" mode deactivates temporarily certain detections to facilitate the elevator car construction in "inspection" mode. As soon as the elevator controller is placed in "automatic" mode and that a call has been placed, the "construction" mode will be deactivated automatically and all signals will be in function.

The elevator controller must be in "inspection" mode

With the controller’s LCD screen:

- Press "ESC" to return to the previous menu.
- Press "UP/DOWN" keys to select the main menu "OPERATION MODE".
- Press "ENTER".
- Press "UP/DOWN" keys to select the sub menu "CONSTRUCTION MODE".

- Press "ENTER".
- Press "UP" to activate the Construction mode.

With the programming console (CQM1-PRO01):

Put the value 0001 in DM 249 to activate the mode (see section 1).

Deactivated Circuits:

- Brake contact supervision.
- Motor temperature "THM".
- Generator signals "GEN1, GEN2".
- Switches supervision "LRH, LRH1, LRB and LRB1 ".
- Switches supervision "SLH and SLB ".
- Motor overload alarm de surcharge for speed reduction (Only the drive protects the motor).
- Bar code inputs "P1, P2, and P3... "
- The fire signals are completely deactivated.
- Car overload signal "LW2".
- All the outputs that set off the alarms are deactivated.

H. At this point of the procedure, please verify:

PLC inputs which must be activated:

- +A, +DC, PC, PP, GTS, LNH, LNB, J, SW6, RDY, SR.
- HDL (locked hall door contact if manual door or motorised cam).

The relays:

- ISR must not be activated.
- R5 must be activated.
- ETSL must be activated for the elevators going faster than 200 FPM.
- BRK must be activated.

The alarms:

- Hold the « MANUAL RESET » button, located on the controller inspection board, for 2.5 seconds. This action reset the controller if every conditions are good and clear the alarms.

- By using the LCD, erase the alarms and then consult the alarms list to check that there are no more. (See LCD section for use of the LCD).

I. Execute the start-up procedures of the drive described at chapter 7 up to section 7.4 included for the Magnetek HPV drive or at chapter 8, up to section 8.4 included for the Control Techniques drive.

J. Adjust the brake:

- **At Start-up**: The holding voltage (if applicable) must be adjusted as the controller drawing on page 2. The length of the overexcitement voltage is adjustable by using a potentiometer or by (DM44) register in the PLC. That delay should be around 1 second.

- **At Stopping**: The brake must be applied completely after 0,2 second. If the car is moving free wheel when the brake drops see section 7.5.4 for Magnetek HPV drive or section 8.6.5 for Control Techniques drive.

- Connect the brake's auxiliary contacts to the controller's "BRC" terminal as per the electrical drawing. (See section 11.6 to activate or deactivate the breaking switch supervision and to set the contact (NO/NC)).

IMPORTANT

The PLC inputs are designed to operate 24 volts DC. DANGER: Never apply 120 volts AC for it may cause severe damage to the inputs.

On reception of the controller, the "COM" terminal is grounded.

K. The car may now be moved in inspectionby using a jumper between "+A" and "PCH" to go up or between "+A" and "PCB" to go down. The car may also be moved using the controller's "UP" and "DOWN" buttons by putting the controller's inspection switch in Inspection mode. However, a jumper must be installed between "+A" and "ISR", the doors' bypass switches must be at "OFF" position and the hoistway key deactivated.

L. All elevator controllers have an unintended car movement detection device (UCM). For an elevator with a contract speed higher than 150 FPM, this safety device uses an independent feedback than the normal position feedback. It can be the perforated tape, the encoder installed on the governor or 2 proximity sensors installed on the top of the tape reader head. For a maximum safety, it is strongly recommended to install this feedback early during the start-up. For an elevator with a contract speed higher than 150 FPM, this detection is made by the "NTSD" processor and for elevators with a contract speed higher than 200 FPM, this detection is made by the "ETSD" processor. See section 9.

4. FINAL START-UP:

A. Proceed to the adjustment of the tape selector or the encoder's governor (Standard tape selector: section 6.1, perforated tape: section 6.2 or governor's encoder: section 6.3).

B. To comply section 2.26.9.4 of the elevator code, "RRC" relay will energize momentary at each start of the elevator. This relay allows to test critical relays: (ISR, XIN, PC, PP, etc..).

C. Put the elevator in "maintenance" mode using the switch in the controller. Put the inspection switch to "NORMAL". It is now possible to place car calls without the doors opening.

D. Make an optimal calibration of the drive and make the final adjustments of the speeds and decelerations (see sections 7.5, 7.6 to 7.7 for Magnetek HPV drive or sections 8.5 to 8.6 for Control Techniques drive).

E. For elevators 200 FPM or less, proceed to the installation and the mechanical adjustment of the slowdown limits (see section 9.1).

F. For elevators 250 FPM and above, proceed to the installation and the mechanical adjustment of the emergency terminal stopping limits (see section 9.2).

G. Remove the jumpers of the mechanical slowdown limits terminals (LRH, LRB, LRH1, LRB1). Remove the jumpers of emergency terminal stopping limits terminals (SLH, SLB).

H. Proceeds to the emergency stopping devices adjustments for elevators 200 FPM and above. (see section 9.2.10).

I. Adjust the hoistway access travelling limits (see section 6.4)

J. Proceed to all tests and adjustments described in sections 9 and 11.

To erase des alarms (3 ways):

- Hold the « MANUAL RESET » button, located on the controller inspection board, for 2.5 seconds. This action will reset the controller if the problem is fixed.
- Activate the "MAINTENANCE" switch 4 times in a row.
- By using the LCD, erase the alarms and then consult the alarms list to check if there is no more problem. (see LCD section for instruction).

WARNING

PLC inputs are designed to operate at 24VDC. DANGER: Never apply 120VAC for it may cause severe damage to the inputs.

On reception of the controller, the COM terminal is grounded.

5. CONTROLLER TYPE:

5.1. Two car group controller (without dispatcher):

A main switch is required for each controller. There is no need for a separate power supply for the group itself.

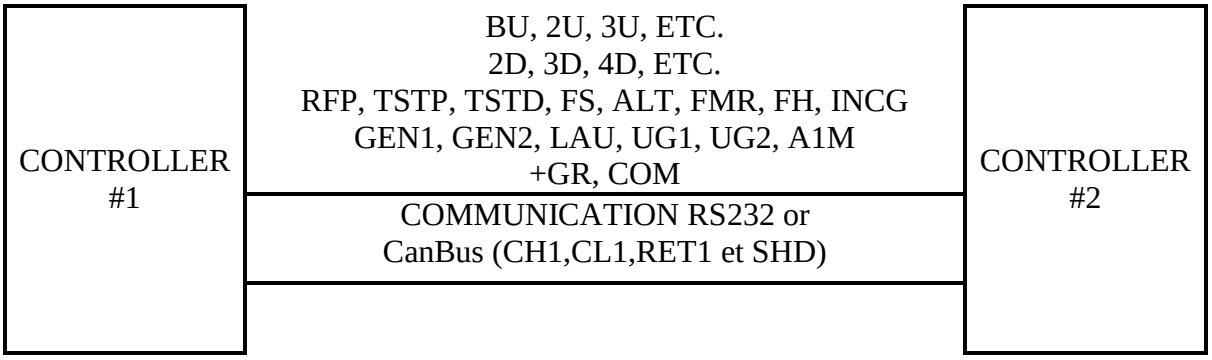
There is a PLC in each controller; as soon as the two PLC's are connected together through their RS232 port or the CanBus network, they automatically become a group and start dispatching hall calls to one another. If the communication link is broken, they start working as two separate controllers. Therefore, you do not have to connect both controllers together during building construction.

That type of controller provides continuous dispatch back up service. This means that as soon as one of the controllers is turned off, looses power, or becomes in trouble, the other one takes over all hall calls without clearing any of them.

Two car group (duplex) connection:

You must connect to both controllers:

- The common supply to the group: +GR, COM;
- The entire hall calls: BU, 2U, 3U, etc.2D, 3D, etc.;
- Phase 1 fire services, if there are any: RFP, TSTP, TSTD, FS, ALT, FMR, FH, INCG;
- Emergency generator services if there is:GEN1, GEN2, LAU, UG1, UG2, A1M;
- After that, connect both PLCs together with the communication port RS232 by using the cable supplied with the controllers or with the CanBus network (CH1,CL1,RET1 et SHD)



Since each controller has its own CPU, if some changes are made to a timer or to a programmed function described at chapter 12, they must be made in both controllers.

5.2. Group controller (with dispatcher):

A main switch is required for each controller: #1, #2, #3, etc. A separate 120VAC power supply is required for the dispatcher.

Each simplex controller has its own CPU, which automatically changes to group mode, when connected to the group network. At that moment, the group dispatches hall calls to each controllers according to a sophisticated algorithm.

The program contained in the group is designed to operate in simplex, duplex, triplex (…) modes. The transition between these modes is automatic.

Each simplex controller has a back up sequence in case the group is not present. Each controller takes over certain hall calls (according to predetermined areas depending on the project) and takes over every car call. That sequence is controlled by each elevator's CPU and the OK signals of each controller.

Example:

In the case of a nine-storied triplex, the controller #1 could take over hall calls for the floors 1 to 3; controller #2 those for the floors number 4 to 6, controller #3 those for the floors number 7 to 9 and each controller takes over all car calls. Controller #1 receives signals OK2 and OK3, which confirms that both elevators are present, and functioning, same thing for the other controllers. Controller #2 receives signals OK1 and OK3 and controller #3 receives signal OK1 and OK2. If controller #2 is absent, controller #1 will take over the hall calls for the floors number 1 to 6 and controller #3 will take over those for the floors number 7 to 9. If controllers #2 and #3 are absents, controller #1 will take over all hall calls, etc.

Group connection:

Connect to all controllers:

- Terminals "COM" and "+GR";
- Phase 1 fire services: RFP, TSTP, TSTD, FS, ALT, FMR, FH, INCG;
- Emergency generator services if there are any: GEN1, GEN2;
- Hall calls: BU, 2D, 2U, etc. only if the controllers using the RS485 communication;
- Presence signals between the controllers: OK1, OK2, OK3, etc.;
- RS485 communication cables (2 shielded pairs): TX+, TX-, RX+, RX, and SHD.

or

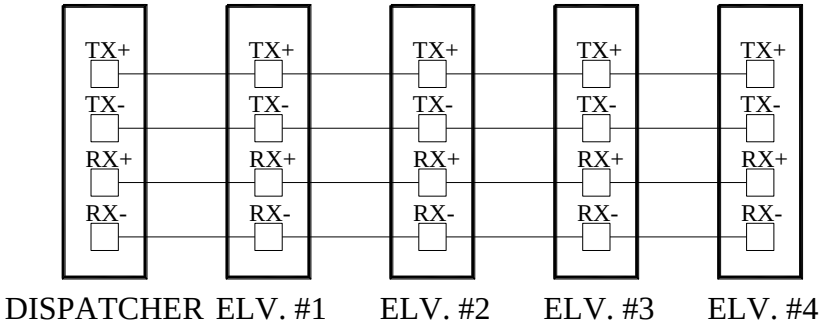
- CanBus Communication (1 shielded pair + 1 x 18AWG): CH1, CL1, RET1, SHD

Connection to the dispatcher:

Connect the following signals on the dispatcher:

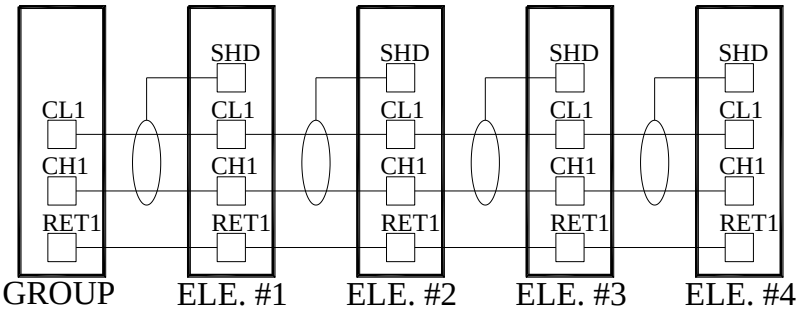
- All hall calls: BU, 2U, 3U, etc. and 2D, 3D, etc.;

- Fire services if there are any: RFP, TSTP, TSTD, FS, ALT, FMR, INCG, FH;
- Emergency generator services if there are any: GEN1, GEN2, UG1, UG2, UG3, etc;
- RS485 communication cables (2 shielded pairs): TX+, TX-, RX+, RX, and SHD.



or

- CanBus Communication (1 shielded pair + 1 x 18AWG): CH1, CL1, RET1, SHD



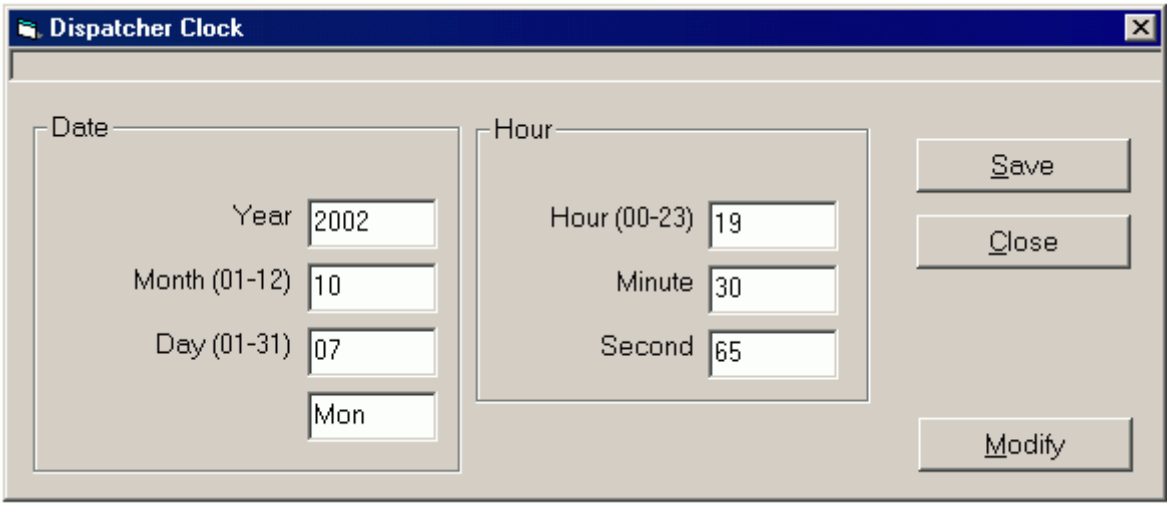
Since all controllers have their own CPU, if there is a modification of the timers, or if there is a programming of the functions described in chapter 12, it must be done on all controllers. If the system has an operator screen, it is possible to carry out, from that screen, the timer modifications and the programming of the specified functions simultaneously on all controllers (Please refer to the operator screen manual).

5.3. Clock setting on dispatcher with operator screen:

The dispatcher has a real-time clock; however, it does not add or subtract an hour automatically when spring or fall comes. It is primarily used for the rush hour variations grid. Thus, it is important to make sure the clock is set at the right time.

To modify time

- Move the mouse cursor on the clock menu and click on the left mouse button.



- Move the cursor on "MODIFY", and click on the left mouse button. From then on, the data boxes are accessible.

- Move the cursor on the box to modify. Enter the new data. Repeat this procedure for each data that needs to be modified.

- Move the cursor on "SAVE" and click on the left mouse button to send the newly set time to the dispatcher. The message "SUCCESS" should appear, if it is not the case, save again.

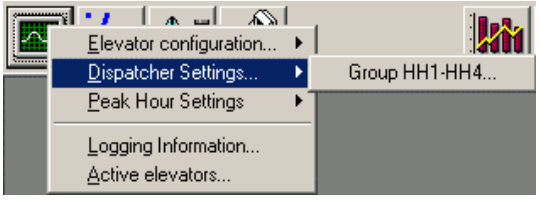
- Windows automatically determines the day of the week.

- To exit the window without modifying the parameters, click on one of the two buttons shown below.

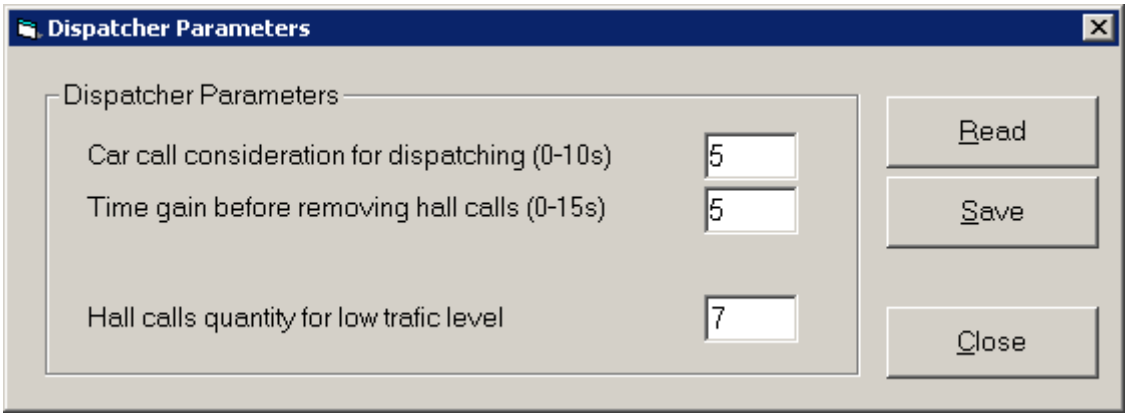
5.4. Call dispatch configuration, using the operator screen:

If the elevator group includes an autonomous dispatcher managing hall calls dispatch, this menu is accessible:

- Move the cursor over the "SINE WAVE" button, and click on the left mouse button.



- Move the cursor on the "DISPATCHER" option and click on the left mouse button.



This window allows modifying some of the dispatcher's parameters.

Dispatch of calls:

- Car calls consideration for dispatching (0-10s):

  When two elevators are moving in the same direction, this parameter gives priority to the elevator that has a car call at the same level of the hall call. The hall call should be given to the elevator that has a car call at the same level, but if the elevator is to far from the hall call level compared to the other elevator, the dispatcher will optimise the waiting time and will give the hall call to the best elevator.

  This parameter should be adjusted according to the number of floors, the speed and the number of elevators in the group. Factory setup at 5 seconds.

- Time gain before removing a call (0-15s):

  The dispatcher computes the waiting time for every new hall call and the ones previously registered. When an interesting time reduction is computed, the hall call will be transferred to another elevator. According to the elevators speed, this parameter can be increased if required. If that parameter is too low, hall calls will switch from a car to another rapidly and continuously.

  Factory setup at 5 seconds.

- Hall calls quantity for detection of low traffic level:

  This register sets a hall call minimal threshold before indicating a low traffic period.

Parameter modification:

- To upload current parameters from the dispatcher, move the mouse cursor over the "READ"button and click on the left mouse button.

- Move the cursor on the box containing the value to modify and click the left mouse button.

- Enter the new value.

- Repeat these two steps for each parameter to modify.

Saving the parameters in the dispatcher:

- Move the cursor on the "SAVE" button and click the left mouse button. When the transfer is done, the message "SUCCESS" should appear, if it's not the case, save again.

- To exit the window without modifying the parameters, move the cursor on one of the buttons shown below and click on the left mouse button:

or

5.5. Peak hours settings:

There are two ways to manage peak hours; there is the automatic way and the manual way. In the automatic mode, the dispatcher uses certain parameters previously received to detect and manage peak hours. In the manual mode, the user specifies at which time and for how long peak hours will be effective.

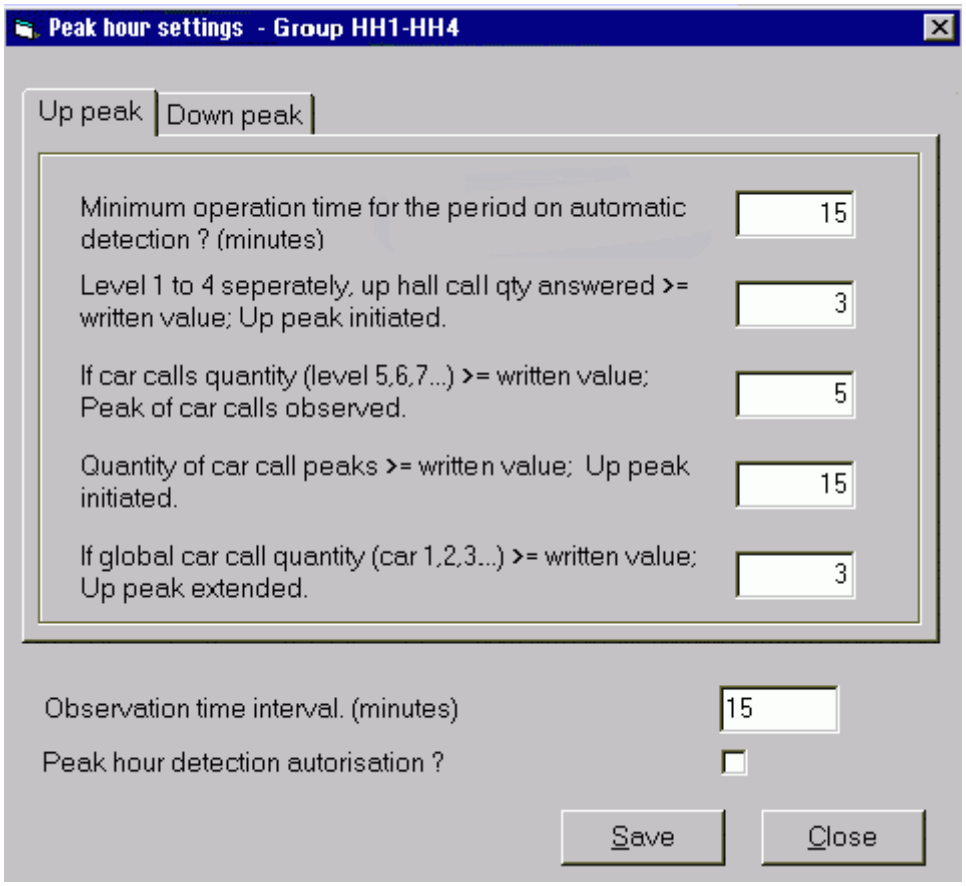
- Move the mouse cursor over the "SINE WAVE" button and press the left mouse button.

- Slide the mouse cursor on the menu "Peak Hour Settings".

- Wait for the menu on the right to appear.

- Slide the mouse cursor to the right to select the desired mode and click the left mouse button to access the selected menu.

Observation Criteria for automatic peak hours detection:


Peak hour settings - Group HH1-HH4
Up peak
Down peak
Minimum operation time for the period on automatic detection ? (minutes)
15
Level 1 to 4 seperately, up hall call qty answered >= written value; Up peak initiated.
3
If car calls quantity (level 5,6,7...) >= written value; Peak of car calls observed.
5
Quantity of car call peaks >= written value; Up peak initiated.
15
If global car call quantity (car 1,2,3...) >= written value; Up peak extended.
3
Observation time interval. (minutes)
15
Peak hour detection autorisation ?
Save
Close

This window has a toll bar offering 2 choices to the user.

- Selecting the peak period to modify:

  Move the cursor on the text corresponding to the requested peak period, and click on the left mouse button. A list of the modifiable parameters will appear with the current values.

- Parameter modifications:

  Move the mouse cursor on the box containing the value to modify and click on the left mouse button. Enter the new value with the keyboard. Repeat for all parameters to modify.

Saving modified parameters:

Move the mouse cursor on the "SAVE" button and press the left mouse button. When the transfer is done, the message "SUCCESS" should appear. If it's not the case, save again.

"Up peak" and "Down peak" parameters are transferred at the same time.

To exit the window without modifying the parameters, move the mouse cursor on one of the following buttons and press the left mouse button:

or

"Up peak" parameters description:

- Minimum operation time of the period with automatic detection:

  As soon as an up peak period is detected, this parameter sets the minimum operation time. When that delay is expired, if the building traffic doesn't require the peak period, the group will return in normal mode.

- Level 1 to 4 separately, number of up hall calls answered >= entered value; Up peak

  The dispatcher counts answered up calls for the 4 first levels of the building. If the value of 1 of these counters becomes equal or higher of the registered value, an up peak period will be initiated.

  When the time interval has expired, the counters are reset and the cycle restarts.

  Example:

  If the dispatcher counts more than 5 up calls at floor 3 in a period of 3 minutes, an up peak period is initiated for 33 minutes.

- If car calls quantity (level 5, 6, 7...) >= entered value; observed peak of car calls:

  The dispatcher determines which elevators are located in the first 4 levels of the building and are in up direction.

  The dispatcher counts up all car calls of the elevators of levels 5, 6, 7 and more.

  If the number of car calls becomes equal or higher to the entered value, a car call peak is observed. When the observed number of peak periods reaches a threshold (following parameter: number of car calls peak >= entered value), an up peak period will be triggered for the time mentioned above.

  When the time interval has expired, the number of car calls peak counter is reset and the cycle restarts.

- Number of car calls peak >= entered value; up peak:

  This parameter fixes a threshold for the car calls peak before triggering an up peak period (see previous parameter).

  Example:

  For a group of 4 elevators, if the elevators are at:

  #1 = 1st floor

#2 = 7th floor

#3 = 5th floor

#4 = 4th floor

Only the car calls from floors 5 and up of elevators #1 and #4 are accumulated. When the count of car calls equals 3, an up peak is observed and when the counts is observed 3 times within 3 minutes, and up peak period is triggered for 33 minutes.

- If the total amount of car calls (car 1, 2, 3, ect.) >= entered value; up peak extended

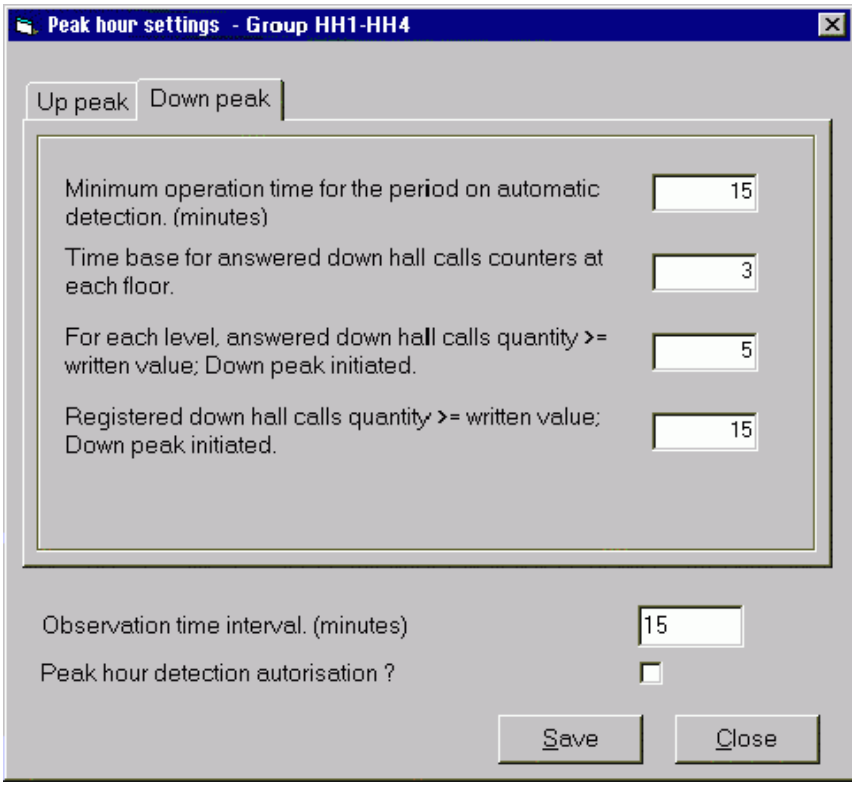
  When an up peak period has been triggered and the minimal operation time has expired, the system returns in normal mode. However, the dispatcher counts all car calls of each elevators and if the count is equal or higher to the entered value, the up peak period will be extended.

  The peak period will no longer be extended as soon as one elevator is free or if the number of car calls is lower than the entered value.

  Example:

  Entered value = 0, up peak period extended until one elevator has stopped and doesn't have any car call.

Down peak parameters description:


Peak hour settings - Group HH1-HH4
Up peak
Down peak
Minimum operation time for the period on automatic detection. (minutes)
15
Time base for answered down hall calls counters at each floor.
3
For each level, answered down hall calls quantity >= written value; Down peak initiated.
5
Registered down hall calls quantity >= written value; Down peak initiated.
15
Observation time interval. (minutes)
15
Peak hour detection autorisation ?
Save
Close

- Minimum operation time when automatic triggering:

As soon as a down peak period is detected, this parameter sets the minimum operation time. When that delay has expired, if the building traffic no longer requires a peak period, the group will return in Normal mode.

- Time base for answered down hall calls counters at each floor (minutes):

  This parameter sets up the observation time interval of each answered down call counters at each floor.

- When the time interval has expired, the counters are reset and the cycle restarts (see next parameter).

- For each level, the number of answered down hall calls >= to the entered value; down peak

  The dispatcher counts answered down calls for each level. If one of the counters becomes equal or higher to the entered value, a down peak period will be triggered.

  The counters are reset each time the time interval base for answered down hall calls has expired.

  Example:

  If 5 down calls at floor 6 are answered in 3 minutes, a down peak period will be triggered.

  The dispatcher will park the elevators as followed:

  Priority 1 level 6

  Priority 2 level 7

  Priority 3 level 5

  For the down peak operation time

- Registered number of down hall calls >= entered value; down peak

  The dispatcher counts the number of down hall calls registered in the building during the observation time.

  If the counted value reaches the entered value, a down peak period is triggered.

  The dispatcher will distribute parking priorities in order to place the cars in an escalator position.

- Observation time interval (minutes):

  This parameter represents the allowed time interval to the different counters to reach the peak periods triggering thresholds.

  When the entered value has expired, the counters are reset and the cycle restarts.

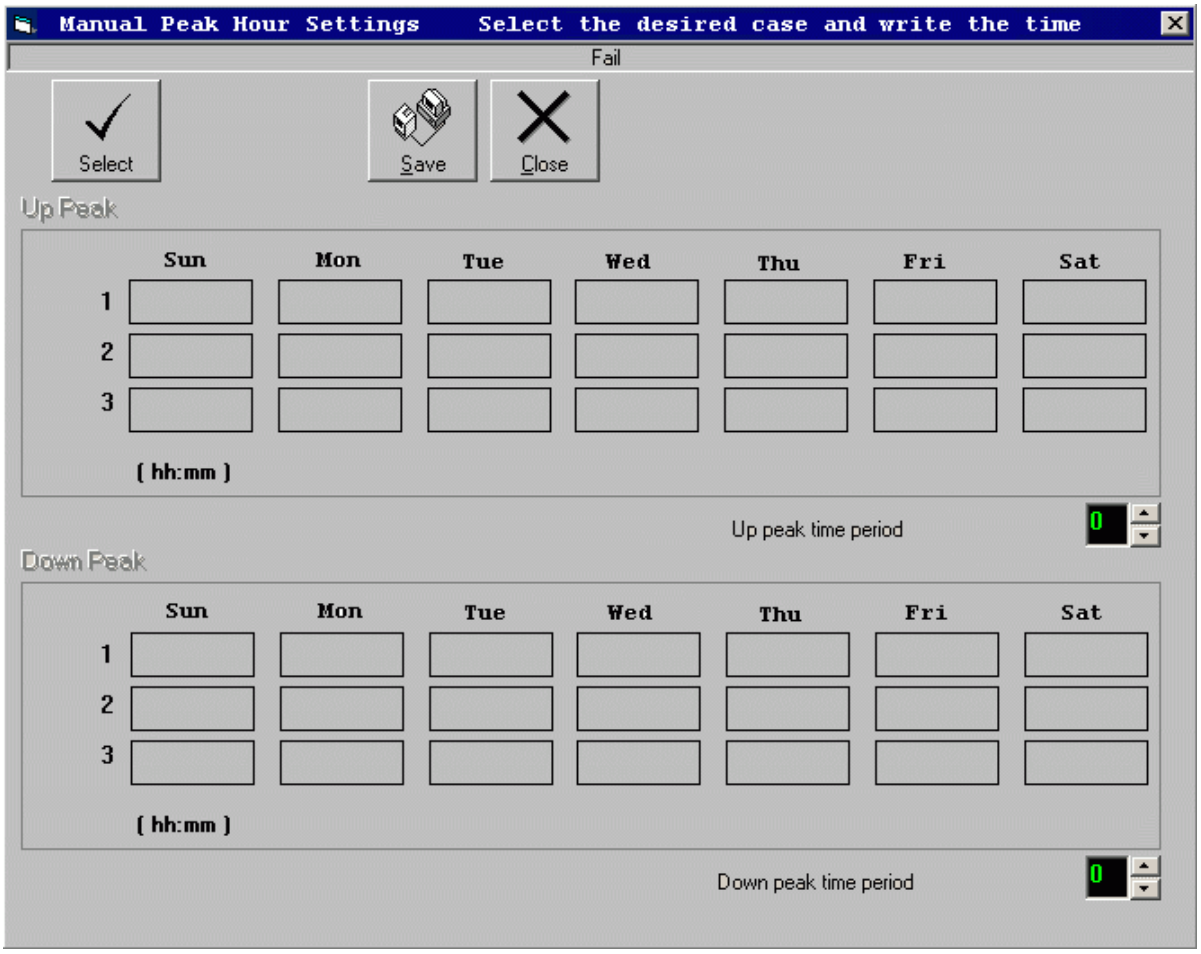
- Automatic triggering authorization:

  To authorize the dispatcher to trigger automatically peak periods, put a check mark in the small square on the right.

  Move the mouse cursor on the right square and click to make appear the check mark and click another time to remove it.

  Don't forget to save before leaving the window.

Peak hours manual triggering:



For the manual peak hour control, two-time grids available. They can be used, to enter every day of the week, three peak activation times. The first grid regards up peaks, where as the second grid regards down peaks.

- Operation:

  The grey time slots represent unused periods. The white ones contain the peak period starting times.

- Selection of the time slots to enter a triggering time:

Move the mouse cursor on the button showing a check mark "SELECTION" and press on the left mouse button. At this moment, the mouse cursor becomes a check mark.

Move the mouse cursor on grey time slot that corresponds to the desired time of day and click on the left mouse button. The time slot will become white and empty. Repeat this operation for each desired slot.

If you press on the left mouse button on a white slot, it will become grey.

When the selection is done, place the mouse cursor on the "SELECTION" button and press on the left mouse button to come back to the normal cursor.

- Entering a triggering hour:

  Move the mouse cursor on a white slot and press on the left mouse button to be able to modify the hour.

  The "COPY / PASTE" option is possible (right mouse button).

- Peak period operation time modification:

  There are 21 possibilities for the triggering of an up peak period and the same for the down peak period. The operation time is the same for all 21 possibilities.

  Move the mouse cursor over the up or down arrows on the right of the black case showing the actual operation time.

  The number increases or decreases each time you click on the left mouse button.

- Saving of the grids:

  Move the mouse cursor on the "SAVE" button and press on the left mouse button. A "SUCCESS" message should appear. If not, save again.

  To exit the window without transferring the grids to the dispatcher, move the mouse cursor on the "CLOSE" button.

6. OPERATION PRINCIPLE FOR CAR ZONING AND LEVELLING:

6.1. With a standard tape selector (zoning by magnet pulses): (IP8300 BIN4 W10):

150 FPM or less:

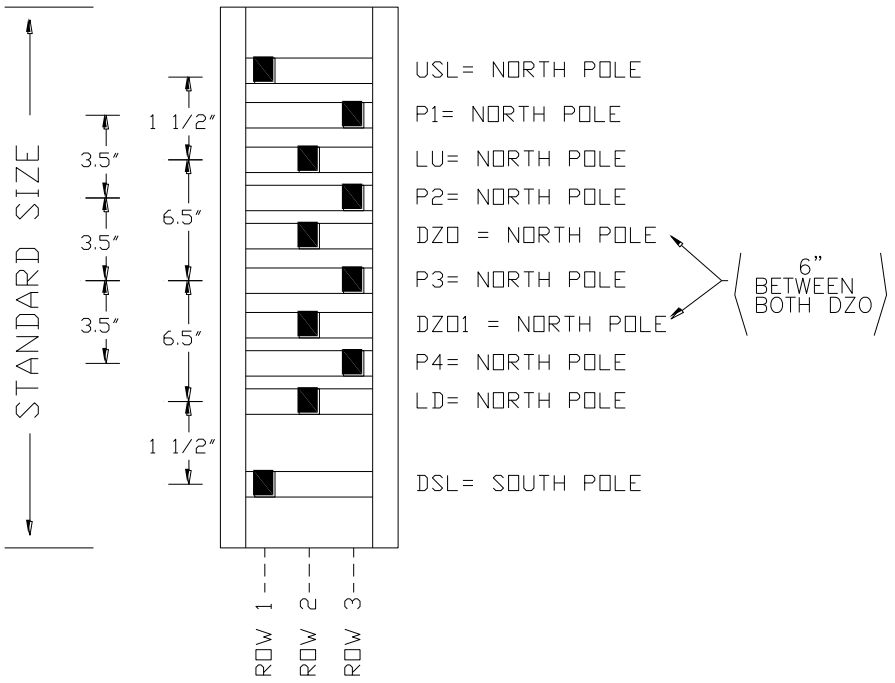
The steel tape is installed in the hoistway and is composed of three rows of magnets; one to control the slowdown, one for the elevator position autocorrecting barcode, and the last one for door zone and levelling. The sensing head is located on the car and has three rows of sensors that are sensible to "North" or "South" magnets. A USL sensor (North) detects the magnets for the up slowdown. The DSL sensor (South) detects the magnets for the down slowdown. Four other sensors (North) detects the center row of magnets: LU sensor for up levelling, LD sensor for down levelling and DZO-DZO1 sensors for door zoning. There are four or five other sensors (North) P1 to P5 that detect the row of magnets for the barcode.

The sensors can be moved inside the sensing head to facilitate the adjustment of the car positioning. For example, in order to achieve the best possible levelling adjustment, it is better and easier to move the LU and LD sensors than to cut off the magnet on the steel tape.

The USL sensor (UP slowdown) and the DSL sensor (DOWN slowdown) engage a slowdown. A ratio of 6" for each 25FPM allows calculating the ideal distance for a good slowdown and also gives the location of the magnets.

Example:

125 FPM X 6 in = 30 in
25 FPM



In order to place the magnets in the correct position on the steel tape, it is recommended to bring the car at the exact position where the command has to be energized when choosing an intermediate floor.

- Levelling magnets (12" magnet): Bring the car even with the floor. Place the magnet on the steel tape so that the DZO sensor is energized but not LU and LD sensors (between LU and LD). The use of two DZO sensors gives the redundancy for the door zone.

- Up slowdown (north USL magnet): For example with a 100'/min speed elevator: bring the car exactly 24" below the landing floor and place the magnet on the steel tape, in order that the bottom end of the magnet energizes the USL sensor.

- Down slowdown (south DSL magnet): For example with a 125'/min speed elevator: bring the car exactly 30" above the landing floor and place the magnet on the steel tape, in order that the top of the magnet energizes the DSL sensor.

- Magnets installation for the binary code. Note: it is very important that the magnets are glued and centered according to the sensors.

	Required magnets for the binary code						
Binary code / Floor	P1	P2	P3	P4	P5	Nbr.	Longueur (pouces)
1	•					1	3
2		•				1	3
3	•	•				2	3
4			•			1	3
5	•		•			2	3
6		•	•			2	3
7	•	•	•			3	3
8				•		1	3
9	•			•		2	3
10		•		•		2	3
11	•	•		•		3	3
12			•	•		2	3
13	•		•	•		3	3
14		•	•	•		3	3
15	•	•	•	•		4	3
16					•	1	3
17	•				•	2	3
18		•			•	2	3
19	•	•			•	3	3
20			•		•	2	3
21	•		•		•	3	3
22		•	•		•	3	3
23	•	•	•		•	4	3
24				•	•	2	3
25	•			•	•	3	3
26		•		•	•	3	3
27	•	•		•	•	4	3
28			•	•	•	3	3
29	•		•	•	•	4	3
30		•	•	•	•	4	3
31	•	•	•	•	•	5	3

•: Sensor should be activated + red DEL in the junction box

P1, P2, P3, P4, P5 = sensors located in the tape selector.

"North" magnets need to be used. The binary code is only validated when sensors are on and the elevator is centered to the floor (DZO = ON, LU = OFF, LD = OFF). These magnets allow correcting the elevator's position, so it is important that the magnets have the right position.

WARNING

For group or duplex, if the elevator does not go to precise floors, the binary shall not be used.

Example: Car calls to the elevator B start from the third floor, 3Z. Thus, the binary code starts at level 3, where only P1 and P2 are activated; the binary code of the first and second floors must not be used.

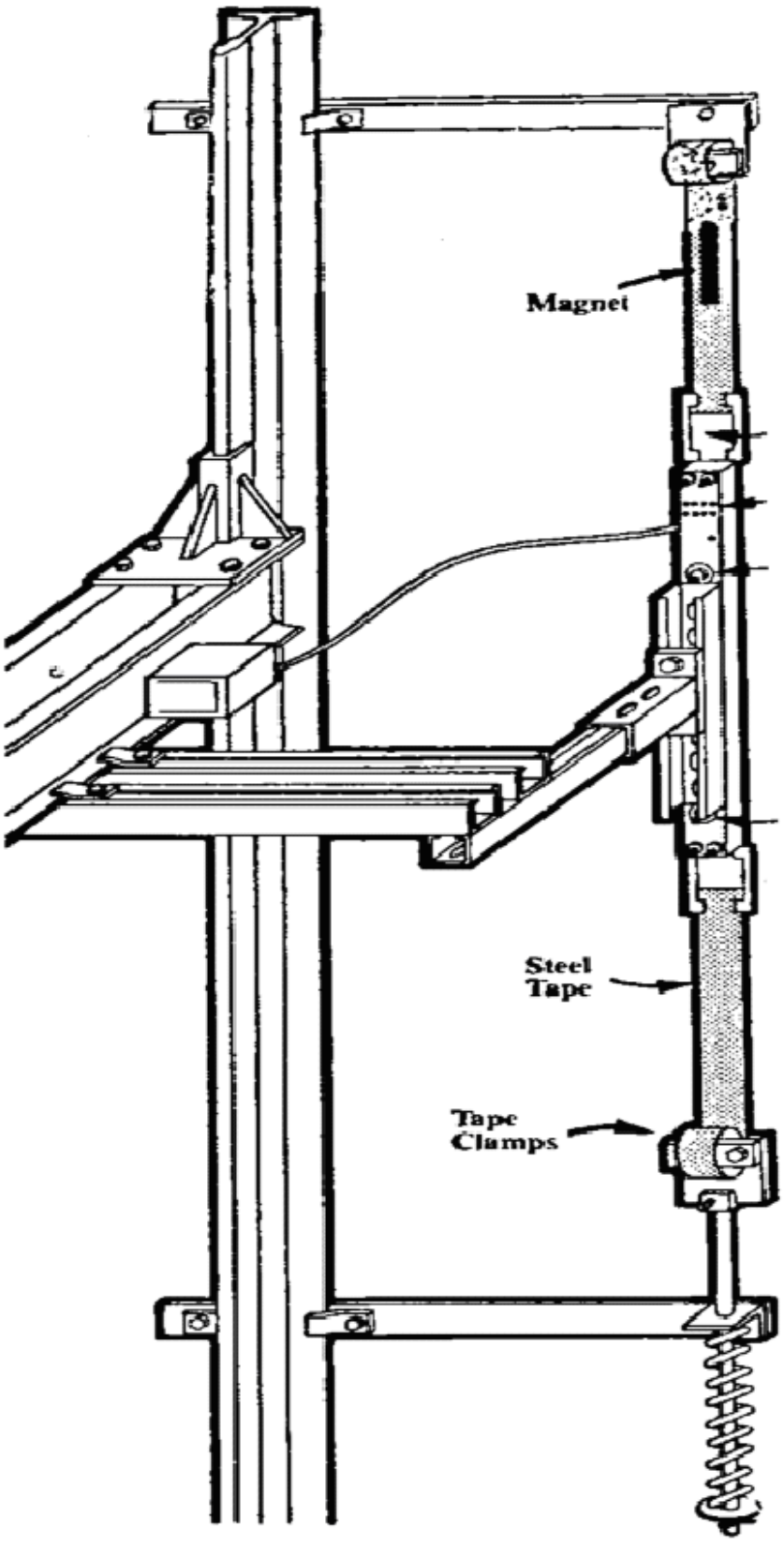
For the positioning of the magnets at the other floors, proceed as mentioned above or as followed:

- Start by placing the 12" magnet (leveller) by proceeding as described previously at the first step and binary code magnets.

- Then, proceed to the other floors. Place the USL and DSL magnets on the basis of the measurements between the USL and DSL magnets according to the 12" magnet of the first floor as described previously at the second and third steps.

It is strongly recommended not to stick the magnets immediately to the steel tape. If a mistake should happen in the positioning, it would still be easy to move the magnets on the tape. Wait until you have made successful tests before sticking definitely the magnets to the tape.

Standard tape selector installation:

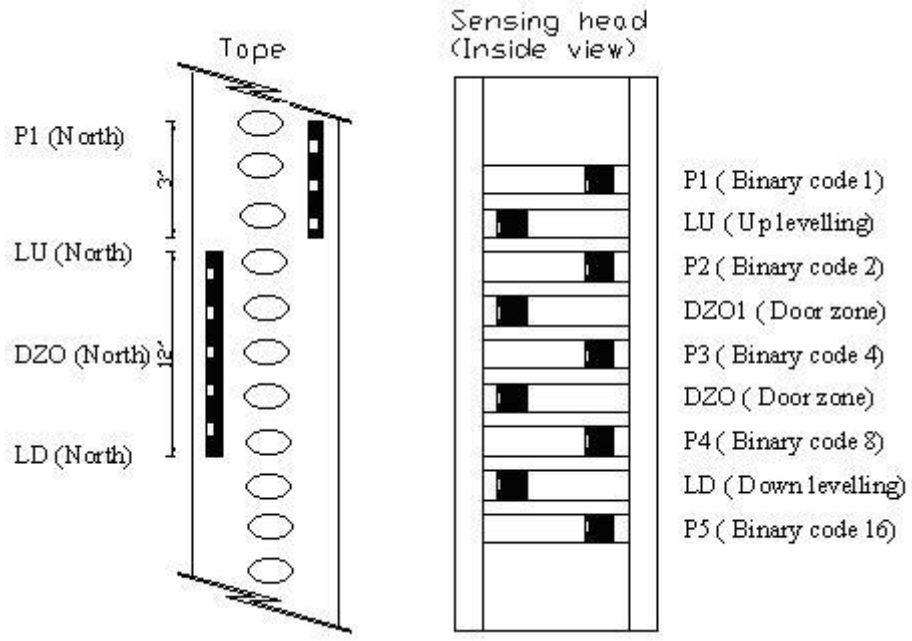


6.2. Using a perforated tape or an encoder installed on the governor:

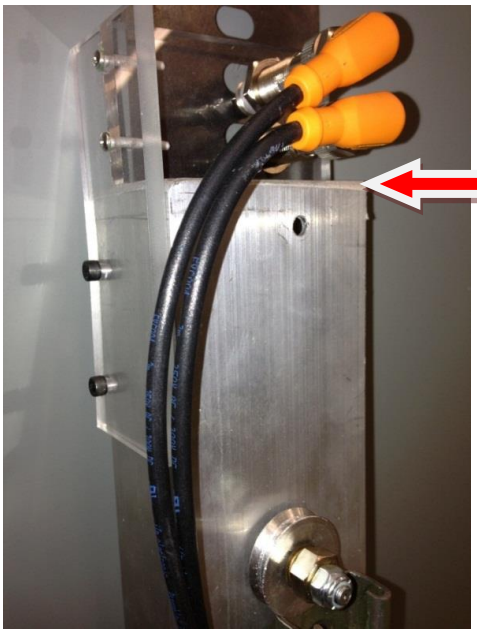
6.2.1. Installation of the perforated tape:

There are no magnets on the tape for the position control and the slowdown activation. The holes counted on the tape control the sequences. The tape has 16 holes per foot. Each count equals to 3/4 inch. The installer only needs to specify how many holes the elevator needs to get to the floor and to start the slowdowns. This number of holes is the same for each floor.

To indicate the positions of the door zone and the levelling, a magnet must be installed on each floor on the left side of the tape. The first requirement is to install magnets at each floor.



Warning, if there are 2 proximity installed on a braket above the IP1200 head, place the guide on the top of the sensor head. Not on the top of the 2 proximity mounting braket.

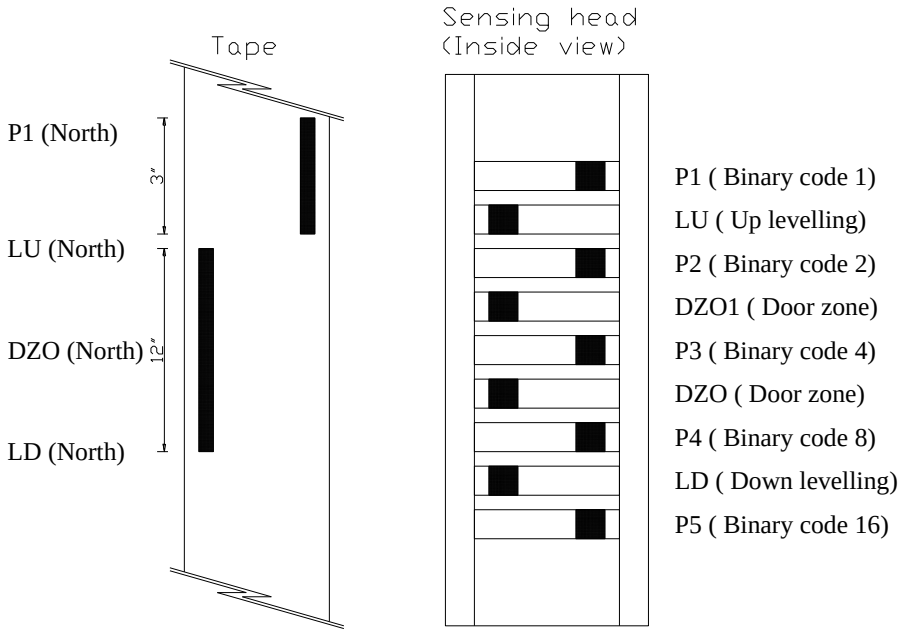


6.2.2. Installation of the standard tape selector and the governor encoder:

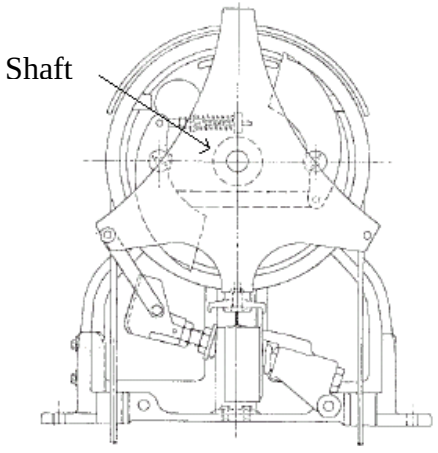
There are no magnets on the tape to control the zones and to start the decelerations; the encoder pulses control those sequences. The encoder has 50 pulses per turn when it is installed at the center of the 12 inches governor's wheel or 70 pulses per turn on 16 inches governor's, which corresponds to the same resolution as the perforated tape (3/16"). The installer only has to specify the number of pulses before reaching a floor to start the decelerations. This same number of pulses will be used for each floor.

Tape selector:

It is necessary to install a magnet at each floor, on the left of the tape, to indicate the position of the door zone and of the levelling device. First of all it is important to begin by placing these magnets at each floor.



Governor encoder:



Connection:

- Turn off the power and install the encoder on the shaft located in the center of the encoder.

- Once this is done, use the same pipeline as the governor's dry contact to pass the encoder wire provided with the controller.

- Connect the wires between terminals HT1, HT2, +24 and COM (see drawings).

6.2.3. Installation of the "Door Zone" and bar code magnets at each floor:

The tape reader on the top of the car, in addition to the 2 door zones sensors, has 4 or 5 sensors that let you confirm the exact floor at each stop.

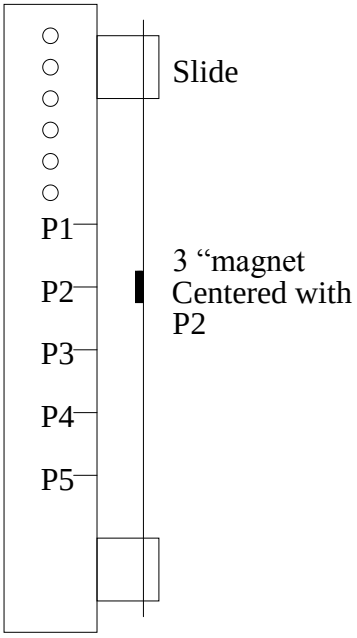
Place the car exactly at the same level than the floor. Place the magnets on the tape so that the DZO and DZO1 are activated but not LU and LD, this means centered between LU and LD. If the controller was supplied with the magnet guide (IP1200-TP1), see the following point for the car positioning.

The table here under explains how to install the magnets and contains a table for a bar code up to 31 floors.

	Magnets required for binary code						
Binary code / Level	P1	P2	P3	P4	P5	Nbr.	Length (inches)
1	•					1	3
2		•				1	3
3	•	•				2	3
4			•			1	3
5	•		•			2	3
6		•	•			2	3
7	•	•	•			3	3
8				•		1	3
9	•			•		2	3
10		•		•		2	3
11	•	•		•		3	3
12			•	•		2	3
13	•		•	•		3	3
14		•	•	•		3	3
15	•	•	•	•		4	3
16					•	1	3
17	•				•	2	3
18		•			•	2	3
19	•	•			•	3	3
20			•		•	2	3
21	•		•		•	3	3
22		•	•		•	3	3
23	•	•	•		•	4	3
24				•	•	2	3
25	•			•	•	3	3
26		•		•	•	3	3
27	•	•		•	•	4	3
28			•	•	•	3	3
29	•		•	•	•	4	3
30		•	•	•	•	4	3
31	•	•	•	•	•	5	3

•: Détectors should be activated as well as the DELs in the junction box.

Example: 2nd floor



The bar code is a protection since the B44-00 code.

P1, P2, P3, P4, P5 = sensors located in the tape selector.

North magnets need to be used. The binary code is only validated when sensors are switched on and the elevator is centered to the floor (DZO = ON, LU = OFF, LD =

OFF). These magnets allow correcting the elevator's position. The right position of these magnets is important.

WARNING

For group or triplex, if the elevator does not go to the lower floors, the bar code will have to start at the same level than the car calls.

Example: Car calls to the elevator B start from the third floor, 3Z. The bar code starts at level 3, where only P1 and P2 are activated.

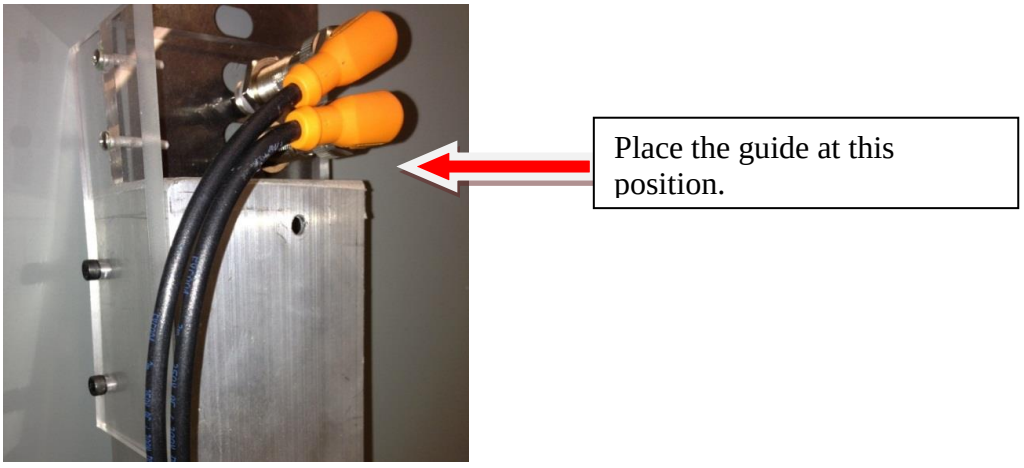
6.2.4. Magnets installation with IP1200-TP1 guide:

Automatisation JRT inc. has developed a guide that allows you to locate rapidly the magnets of the doors zones (DZO) and the magnets of the binaries codes (P1 to P5).

Procedure:

- Align the elevator floor and the hall floor.
- Position the row guide as shown in figure 1.

Warning, if 2 proximity switches are mounted above the sensor head, the guide must be placed at the position shown by the picture not above the proximity bracket.



- Move the car down and place the the guide magnet supplied as in figure 2.
- Position the JRT template under the magnet as in figure 3.
- Stick the DZO magnet in the reserved space of the JRT template.
- Stick the magnets P1 to P5 for the binary code according to the selected floor, the template indicates which magnet to stick according to the selected floor. Example: for the 1st floor, only the magnet P1 has to be stuck. For the 3rd floor, the magnets P1 and P2 must be stuck.

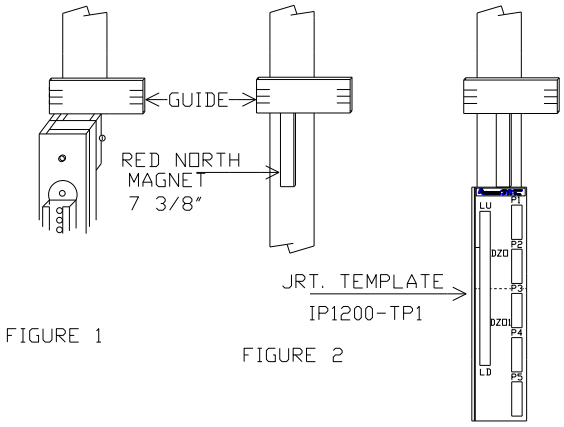


FIGURE 1

FIGURE 2

FIGURE 3

6.2.5. High speed counter verification:

Before recording the floors position, the high-speed counter has to count in the right way.

<u>To monitor the value from the LCD screen, do as the following (To monitor the value from the PLC with the programming tool, see section 1):</u>

- Press "ESC" and on the "UP/DOWN" keys to select "REGISTER ACCESS".
- Presses "ENTER".
- Choose "DM" for the register type.
- Press "ENTER"
- Press on the "LEFT/RIGHT" keys and "UP/DOWN" to enter 5800.
- Press "ENTER".

Note: DM5800 is the lower part and DM5801 is the higher part, example: 52 000, DM5801 = 0005 and DM5800 = 2000.

0 ----------> 10 000 000

0000	0000	1000	0000
DM 5801	DM 5800	DM 5801	DM 5800

Activate the PCH signal to make the car go up in inspection mode. The value must increase. If not, invert the HT1 and HT2 signals.

6.2.6. Recording of floors position:

- Make sure that the 12” magnets (door zone) are correctly installed on each floor. Refer to section 6.2.1.

- The controller has to be in controller "inspection" mode.

- Lower the car to the bottom landing. The normal down limit “LNB” must be opened and “LU” sensor activated. At this time, the car must be lower than the bottom landing. Be sure that “LNB” limit is open, if not, move down the car again. Now initiate the learning mode.

With the LCD screen, do the following:

- Press "ESC" to return to the previous menu.
- Press "UP/DOWN" keys to select the main menu "ELEVATOR & LCD SETTINGS".
- Press "ENTER".
- Press "UP/DOWN" keys to select the sub menu "RECORDING FLOORS POSITION".
- Press "ENTER".
- Press "UP" to activate.

- To interrupt the floor learning process at any time, put the elevator in normal mode for a few moments or turn off the power.

- You need to move the elevator in inspection speed until the normal up limit (LNH) will open. Be sure that “LNH” switch opens around 2 inches above the top floor landing position.

- **With control inspection command :**

Put the hall and car door bypass to OFF position. Put a jumper between terminals « +A» and «ISR». Put the control inspection switch to «INSPECTION» position. Press the «UP» button on the board «JRT-INT-02» to move up the car.

- **With top of car inspection command :**

Disconnect the wire on « ISR » terminal. The indicator for « ISR » must be at OFF. Put a jumper between terminals « +A» and «PCH».

Make sure that LNB input on the PLC must came back on before the "LU" input turns off. If not, the bottom landing position will not be registered.

The LCD screen allows to follow the learning floor positions. It increases by 1 each time a floor position is memorized. Therefore, at the end of the learning position the register is supposed to show the number of floors. If the elevator stops at the top floor and the output of the PLC is still blinking, this means that one or more floors have not been recorded. Verify the normal limits at the top and the bottom, and redo the record.

If all the floors have been recorded and that the output is no longer blinking, the position of each floor, in number of pulses from the bottom to top, is recorded in the processor.

Run the car in inspection mode. The position indicator will increase or decrease according to the position of the car, if the number of holes for slowdown has been entered as described in section 6.2.7.

If the indicator does not seem to operate correctly, repeat this procedure.

At this time, the elevator is ready for operation in "automatic" mode. The perforated tape or the governor encoder programming completed.

6.2.7. Programming the slowdown distance:

The recommended distance for a normal slowdown to the floor is 6 inches per 25 FPM.

Example:

$$\frac{200\ FPM \times 6\ in}{25\ FPM} = 48\ in$$

Tape or the encoder have 16 counts / ft = 1 count / 0.75 in

$$Therefore: \frac{48\ in}{0.75} = 64\ counts$$

Slow down distance table:

- 100 FPM = 24 in = 32 counts
- 150 FPM = 36 in = 48 counts
- 200 FPM = 48 in = 64 counts
- 250 FPM = 60 in = 80 counts
- 300 FPM = 72 in = 96 counts
- 350 FPM = 84 in = 112 counts
- 400 FPM = 96 in = 128 counts

Elevators reaching the contractual speed between each level (Elevators 250 FPM and less):

Enter the number of counts for slowdown distance to the floor in register DM132.

Elevators with a floor to floor speed and a two floors speed and more (Elevators 250 FPM and more):

Enter the number of counts for slowdown distance to the floor:

- DM132: for a "one floor run".
- DM133: for high speed runs.

To modify the value with the LCD in the controller (To mofidy the value with the programming tool, see section 2):

- Press "ESC" and the "UP/DOWN" keys to choose "REGISTER ACCESS".
- Press "ENTER".
- Choose "DM" for the type of register.
- Press "ENTER".
- Press the "LEFT/RIGHT" and "UP/DOWN" keys to enter 132.
- Press "ENTER"
- Press the "LEFT/RIGHT" and "UP/DOWN" keys to enter the number of desired counts (example: 91=0091).
- Press "ENTER".

The number of counts can be changed at any time when the car is stopped.

6.3. high speed counter Verification (Count Loss):

The LCD monitoring screen indicates the actual elevator position in counts from the “LNB” limit switch (bottom floor).

Every time the elevator is stopped at a floor, the recorded floor position is moved in the high-speed counter.

Count loss

When the elevator stops at the floor, observe the value that will be in the register after 2 seconds.

If the value changes for more than 2 counts, it may indicate a count loss or that the recorded floor position is incorrect.

Relearn all floor positions another time and if the problem is still present, verify “HT1” and “HT2” shield. Cleaning the tape reader can solve the count loss problem.

Day light or high power lights generate infrared rays that can affect the perforated tape high-speed counter.

6.4. Detecting floors having a problem with the bar code magnets:

Elevator controllers memorizes which floors were corrected by the bar code reader. It keeps in its memory the last 10 levels that were modified.

This tool can be very useful to locate at which floor a problem occurs.

Example of a problem with a magnet at the 18Z:

	Level at which the car stops to answer a call (Bz, 2z, 3z…).		**Level confirmed by the bar code reader (P1, P2, P3, P4, P5)**
DM2960	18 Z	DM2970	16 Z
DM2961	20 Z	DM2971	22 Z
DM2962	18 Z	DM2972	16 Z
DM2963	15 Z	DM2973	17 Z
DM2964	18 Z	DM2974	16 Z
DM2965	13 Z	DM2975	15Z
DM2966	0	DM2976	0
DM2967	0	DM2977	0
DM2968	0	DM2978	0
DM2969	0	DM2979	0

In that example, each time the elevator stops at the 18Z, the bar code reader corrects the position to 16Z. When the elevator will travel to another floor, the bar code reader will readjust the position by two floors.

If you look closely at the binary code (P1…P5) of the 18Z and of the 16Z (see previous page), you will see that the "P2" sensor at the 18Z is missing.

Move the elevator in inspection mode to the 18Z and correct the error with the sensor or the misplaced magnet. Once the error is corrected, erase the list in its entirety by following the steps described below.

Write 1234 in theDM2940 to clear bar code errors buffer:

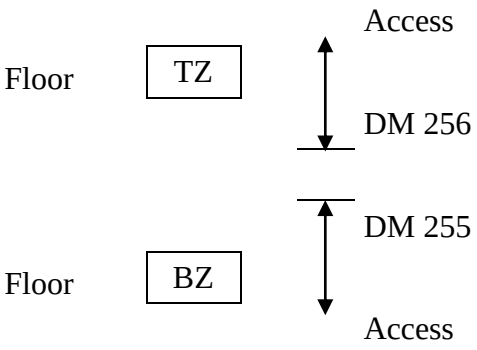
Using the LCD (to modify the value with the programming tool, see section 1):

- Press "ESC" and the "UP/DOWN" keys to choose "REGISTER ACCESS".
- Press "ENTER".
- Choose "DM" for the type of register.

- Press "ENTER".
- Press the "LEFT/RIGHT" and "UP/DOWN" keys to enter 2940.
- Press "ENTER"
- Press the "LEFT/RIGHT" and "UP/DOWN" keys to enter 1234
- Press "ENTER".

6.5. Hoistway access travel adjustment:

6.5.1. With perforated tape or encoder installed on the governor:



The controller can limit the hoistway access travel to the bottom and top floors. This prevents the mechanical limits installation. Each count equals to 3/4 inch.

DM 255: Number of counts making the bottom floor travel zone. (16 counts / ft)

DM 256: Number of counts making the top floor travel zone. (16 counts / ft)

Example:

Using the LCD (to modify the value with the programming tool, see section 1):

- Press "ESC" and the "UP/DOWN" keys to select "REGISTER ACCESS".
- Press "ENTER".
- Choose "DM" for the register type
- Press "ENTER"
- Press on the "LEFT/RIGHT" and "UP/DOWN" keys to enter 0255.
- Press "ENTER".
- Press "ENTER" to modify the value. Enter the new value and press "ENTER" to save the modification.

6.5.2. With Standard tape:

No more need to install mechanical switches to delimit the zones of movement of the top and the bottom in hoistway access if the distance between levels does not exceed 10 feet (see article 2.12.7.3.6 and 2.12.7.3.7 of the code B44). This option is available only for the elevators without perfored tape.

DM0063 = 0000. Activate the hoistway access limit by the sensor DZO or DSL of the tape reader.

DM0063 = 0001. Deactivate the hoistway access limit by the sensor DZO or DSL of the tape reader. Mechanical switches must be installed to limit the movement of the hoistway access at the top and the bottom.

Top landing:

The program of the elevator controller detects that the elevator reached the door zone sensor (DZO) or the down slowdown sensor (DSL) of the floor below the top floor. When the sensor DZO or DSL is reached, the down command of the hoistway access is deactivated.

DM0062 = 0001. Deactivate the down command of the hoistway access when the DSL sensor of the floor below the top floor is reached.

DM0062 = 0000. Deactivate the down command of the hoistway access when the DZO sensor of the floor below the top floor is reached.

Bottom landing:

The program of the elevator controller detects that the elevator reached the door zone sensor (DZO) or the up slowdown sensor (USL) of the floor above the bottom floor. When the sensor DZO or USL is reached, the up command of the hoistway access is deactivated.

DM 0059 = 0001. Deactivate the up command of the hoistway access when the USL sensor of the floor above the bottom floor is reached.

DM 0059 = 0000. Deactivate the up command of the hoistway access when the DZO sensor of the floor above the bottom floor is reached.

7. MAGNETEK HPV DRIVE START-UP:

7.1. Connections:

7.1.1. Isolation transformer connections:

If your elevator control package includes an isolation transformer, maintain the drive input voltage between 5 to 10 Volts around the drive supply voltage. Example: 450 to 470 Volts for 460 Volts drive input. Select the appropriate transformer taps at the primary side.

For safety reasons, the terminal "X0" must be grounded.

Refer to section 7.1.3 (Motor connections).

7.1.2. Encoder connections:

The current HPV drive program requires the installation of an encoder to operate. The encoder's multi-wire conductor must be isolated in a pipe in order to eliminate any electrical interference on power lines. This conductor must be shielded. The shield is connected on the "ESHD" terminal in the elevator controller. Connect the encoder as indicated in the drawings supplied with the controller.

Care must be taken for the encoder alignment on the motor shaft. Vibrations will cause ripples in the speed regulations and reduce the encoder life.

7.1.3. Motor connections:

Connect the motor leads to terminals or on power contactor T1, T2, and T3 in the controller.

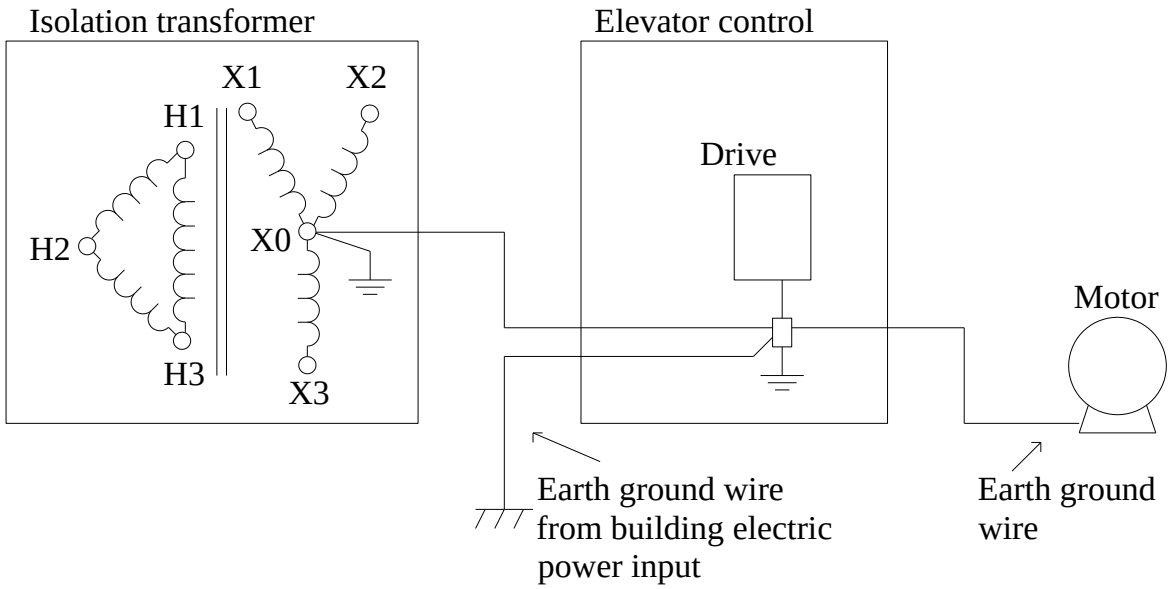
Refer to the motor nameplate for the appropriate voltage connection.

If the motor has a temperature switch, it must be connected according to the schematic.

If the motor does not have a temperature switch deactivate the option by putting DM0183 at 1234.

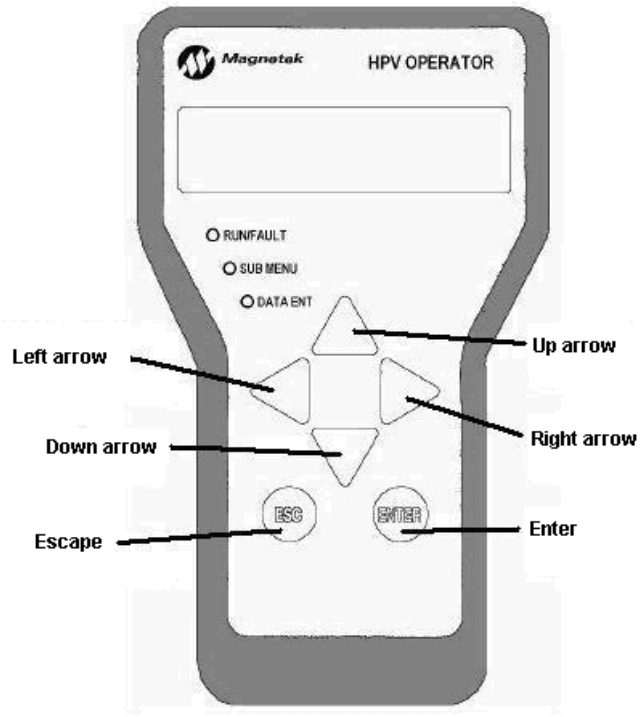
WARNING

The grounding conductors must be connected as followed:



7.2. Functionning of the variable speed drive:

7.2.1. Variable speed drive keypad operation:



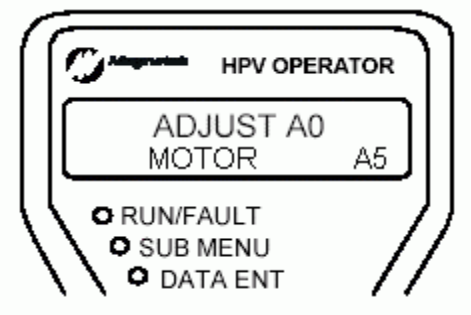
The left and right arrow keys give access to the different menus or they let you place the cursor on the digit to be modified.

The up and down arrow keys give you access to the sub-menus or give you access to the parameters of the selected sub-menu. They also allow you to change a parameter value in edit mode.

The "Enter" key gives you access to a sub-menu. A red light will appear beside SUB-MENU to indicate that a sub-menu has been chosen. This key also lets you go in edit mode to change a parameter and saving it.

The "Esc" key lets you return to the main menu or to cancel a modification in edit mode.

7.2.2. Modifying a drive parameter:



To modify a drive parameter, the sequence is the following:

- Use the right and left arrows to find the menu (example: "ADJUST A0") (Press "ESC" to return to the menu if you are in a sub-menu).
- Use the up and down arrows to find the sub-menu "MOTOR A5" and press "ENTER" to have access to the sub-menu parameters.
- Use the up and down arrows to find the parameter to modify (example: "Motor Poles") and press "ENTER".
- When the parameter to modify has many choices, use the up and down arrows in order to choose (example: "06 poles"). If the parameter is a numeric value, use the left and right arrows to place the cursor on the number to modify (example: "0070") and use the up and down arrows to change the number value.
- When the parameter has the wanted value, press "ENTER" to save the value and exit the Edit mode, or press "ESC" to cancel the modification and exit the Edit mode.

7.2.3. Save drive parameters:

The Magnetk HPV variable speed drive saves automatically the parameters as soon as they are modified.

7.2.4. Drive error list access:

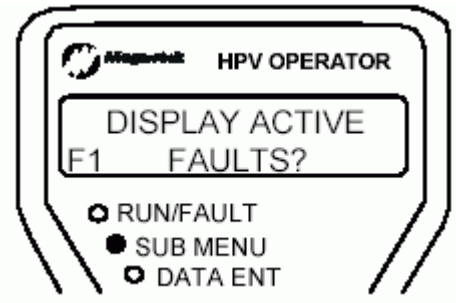
Two classes of warnings are reported by the HPV drive. They are identified as faults and alarms.

Faults:

A fault like a severe failure will stop the drive if it has been running and prevent the drive from starting as long as it is present. To clear all faults, it requires some type of action by the user to clear. A priority message will overwrite what was currently displayed. The user can clear this message by pressing any key on the digital operator keypad. If another fault is present, it will appear as a priority list.

Clearing a fault on the display does not clear the fault from the active error list. The user must clear the fault.

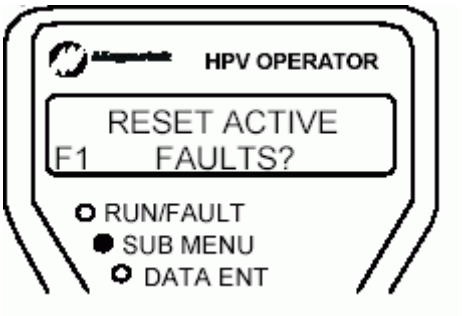
Faults list access:



- Use the left and right arrow keys to find the menu "FAULTS F0";
- Use the up and down arrow keys to find the sub-menu "ACTIVE FAULTS F1" and press "Enter" key;
- Use the up and down arrow keys to find the sub-menu "DISPLAY ACTIVE" and press "Enter" key;
- Use the up and down arrow keys to scroll all active faults.

Resetting active faults:

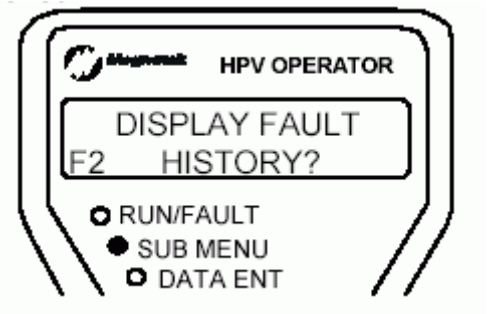
First, the fault condition must be corrected and after the active fault list can be cleared from the drive memory.



- Use the left and right arrow keys to find the menu "FAULTS F0";
- Use the up and down arrow keys to find the submenu "ACTIVE FAULTS F1" and press "ENTER" key;
- Use the up and down arrow keys to find the submenu "RESET ACTIVE" and press "ENTER" key to reset the fault list;
- Press any key to get out.

To access the fault history list:

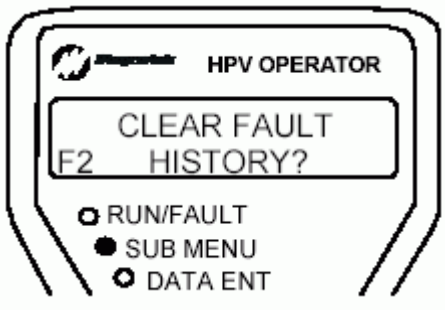
The drive records the last 16 faults with a 1-hour base time stamp.



- Use left and right arrow keys to find the menu "FAULTS F0"
- Use the up and down arrow keys to find the submenu "FAULT HISTORY F2" and press the "ENTER" key.
- Use the up and down arrow keys to find the submenu "DISPLAY FAULT" and press the "ENTER" key.
- Use the up and down arrow keys to scroll through the faults.

Resetting the fault history:

Before clearing the fault history, verify that no fault is activated in the sub-menu "ACTIVE FAULTS" and the fault led is off on the drive keypad.



- Use the left and right arrow keys to find the menu "FAULTS F0"
- Use the up and down arrow keys to find the submenu "FAULT HISTORY F2" and press "ENTER" key.
- Use the up and down arrow keys to find the submenu "CLEAR FAULT" and press "ENTER" key.
- Press any key to get out.

For a complete description of the faults, refer to the HPV variable speed drive owner's manual.

Alarms:

Unlike faults, alarms do not stop the drive. When an alarm occurs, it appears on the screen as another priority message. Like faults, they will appear in order of priority, if more than one occur at the same time. Press any key to clear this message.

If alarms are still present, they will reappear on the screen when the drive will receive a "RUN" command.

For a complete alarm description, refer to the HPV variable speed drive owner's manual.

7.3. Programming of the encoder and motor parameters:

These parameters have been programmed by Automatisation JRT inc. However, these parameters will have to be changed for a best elevator performance.

7.3.1. Encoder parameters:

ADJUST A0 → DRIVE A1 → ENCODER PULSES:

This parameter contains the number of pulses per encoder revolution (check with the encoder, generally 1024 or 2048).

7.3.2. Motor parameters:

The following parameters can be obtained by reading the motor nameplate:

ADJUST A0 → MOTOR A5 → MOTOR ID:

This parameter contains the number of motor poles.

Number of poles = $\frac{\text{120 Degrees X frequency Hz}}{\text{RPM motor}} = \frac{\text{120 Degrees X 60Hz}}{1800}$ = 4 poles

- 900 RMP at 60Hz = 8 poles
- 1200 RMP at 60Hz = 6 poles
- 180 RMP at 60Hz = 4 poles

ADJUST A0 → MOTOR A5 → RATED MTR PWR:

This parameter contains the motor horsepower (Example: 5 HP).

ADJUST A0 → MOTOR A5 → RATED MTR VOLTS:

This parameter contains the motor voltage (Example: 460 Volts).

ADJUST A0 → MOTOR A5 → RATED EXCIT FREQ:

This parameter contains the motor frequency (Example: 60 Hz).

ADJUST A0 → MOTOR A5 → RATED MOTOR CURR:

This parameter contains the motor current indicated on the motor nameplate or on the data sheet given by the motor supplier (Example: 6.6 AMP).

ADJUST A0 → MOTOR A5 → MOTOR POLES:

This parameter contains the number of motor poles.

Number of poles = $\frac{\text{120 Degrees X frequency Hz}}{\text{RPM motor}} = \frac{\text{120 Degrees X 60Hz}}{1800}$ = 4 poles

- 900 RMP at 60Hz = 8 poles
- 1200 RMP at 60Hz = 6 poles
- 1800 RMP at 60Hz = 4 poles

The number of poles is always an even number, or else the "SETUP FAULT #3" fault will appear.

ADJUST A0 → MOTOR A5 → RATED MTR SPEED:

This is the motor rated RPM (coming from the nameplate). (Exemple: 1175 RPM)

In the case of 1 or 2 speed AC motors, the "RATED MRT SPEED" allow to modify the slip frequency. Subsequently readjust motor speed when attempting full load testing.

ADJUST A0 → MOTOR A5 → % NO LOAD CURR:

This parameter represents the % of the full load motor current to turn the motor with no load.

Generally, write down 40 %. High slip motors require about 55 to 60 % of the nominal current to run. This parameter will be readjusted subsequently.

ADJUST A0 → MOTOR A5 → OVLD START LEVEL:

Allows to set the maximum current generated by the drive when continually running.

Example:

110 %, if the current exceeds 110 %, after a certain amount of time, the "DRIVE OVERLOAD" fault will appear.

Furthermore, "OLVD START LEVEL" and "OVLD TIME OUT" allow to define the maximum current the motor can bear.

ADJUST A0 → MOTOR A5 → OVLD TIME OUT:

Defines the delay before the "MTR OVERLOAD" alarm appears.

Example:

OVLD START LEVEL = 110 %

OVLD TIME OUT = 10 sec

OVLD START LEVEL + 40 % = 150 %

(The drive processor always adds 40% current more)

So, if the motor current stays at 150% for 10 seconds, the "MTR OVERLOAD" alarm will be activated. See section 5.3.2 in the HPV variable speed drive owner's manual for more details.

7.3.3. Operating Parameters:

ADJUST A0 → DRIVE A1 → CONTRACT CAR SPD:

This parameter indicates to the drive processor the elevator contract speed in FPM.

ADJUST A0 → DRIVE A1 → CONTRACT MTR SPD:

This parameter indicates to the drive processor the motor speed (in rpm) required to run the elevator at contract speed.

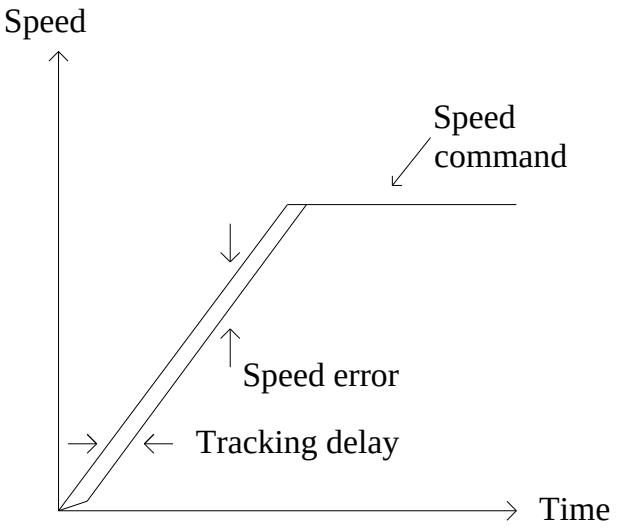
This parameter is not necessarily the motor rated speed from the nameplate

7.4. Variable speed drive gains Programing:

Automatisation JRT Inc has programmed these parameters. However they can be modified in order to obtained optimum elevator performances.

7.4.1. Speed regulator time response:

ADJUST A0 → DRIVE A1 → RESPONSE (Gain):



This parameter sets the tracking delay time for the drive speed regulator.

A higher value reduces the tracking delay time. The elevator speed will be tighter to the speed pattern. A too high value can generate speed vibration and if the value is too low the car will not follow the pattern.

Enter 10 radian / sec. to begin.

ADJUST A0 → DRIVE A1 → INERTIA:

This parameter represents the time (in seconds) to accelerate the elevator from 0 to contract speed with the motor current name plate.

Increasing that value will reduce overshoot and undershoot on speed transitions. With a too high value, it will be too long to get the commanded speed. It will be very difficult to adjust precisely floor stops.

Enter 1.2 sec to begin.

The speed variator has a function allowing a more precise measurement of the "INERTIA" parameter (see section 7.6).

ADJUST A0 → DRIVE A1 → GAIN REDUCE MULT:

This parameter works with the parameter "GAIN GHNG LEVEL". That parameter reduces the "RESPONSE" gain for a smoother ride over a speed point.

Enter 70 % to begin.

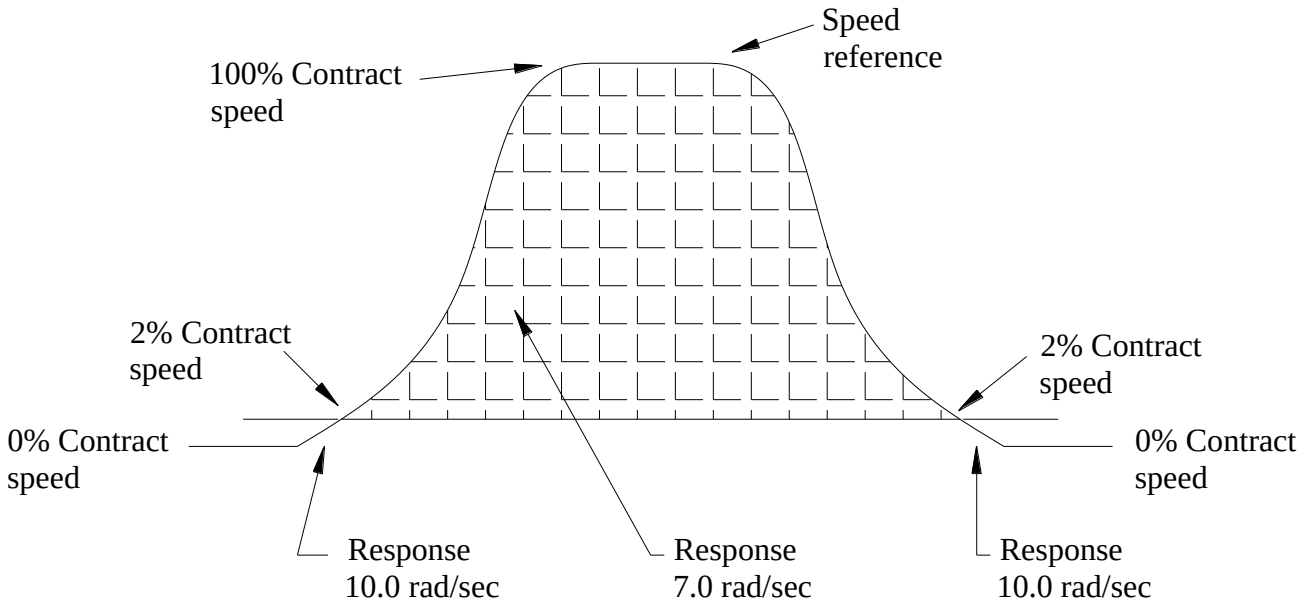
ADJUST A0 → DRIVE A1 → GAIN CHNG LEVEL:

This parameter determines at which speed the "GAIN REDUCE MULT" will be applied to the "RESPONSE" gain. That value is computed at the factory.

How to calculate the %:

Example:

ELV 350 FPM
Leveling speed 7 FPM
7 FPM X 100 = 2%
350 FPM
GAIN REDUCE MULT = 70 %
GAIN CHNG LEVEL = 2 %
REPONSE = 10.0 rad/sec



When speed is faster than 2 % of the "CONTRACT SPEED" 350 X 0.02 = 7 FPM, the drive goes into "Low gain" mode. This mode allows to reduce the "RESPONSE" according to the "GAIN REDUCE MULT".

In "Low Gain" mode:

- "RESPONSE" = "RESPONSE" x "GAIN REDUCE MULT"
    - "RESPONSE" = 10 rad/sec x 70 % = 7 rad/sec

7.4.2. Drive overspeed detection:

ADJUST A0 → DRIVE A1 → OVERSPEED LEVEL:

This parameter sets the motor rotation speed error tolerance percentage.

Example:

115 % X 300 FPM = 345 FPM

So, if the elevator speed exceeds 345 feet/min., the drive will trip after the overspeed time and display the "OVERSPEED FLT" message. The elevator controller will apply the brake automatically.

ADJUST A0 → DRIVE A1 → OVERSPEED TIME:

This is the time before tripping according to the "OVERSPEED LEVEL" programmed.

7.5. Speed, acceleration/deceleration parameters programming:

7.5.1. Programming of operations speeds:

Connect all the signals necessary in order to move the elevator in the desired mode. The car top inspection speed PS1 + PS2 is set to 60 FPM during manufacturing.

Compare the wanted speed with the parameter "DISPLAY D0 → ELEVATOR DATA D1 → SPEED REFERENCE" and the actual motor speed, parameter "DISPLAY D0 → ELEVATOR DATA D1 → SPEED FEEDBACK". The speeds are in FPM.

Try to move the car in inspection mode and note the car's actual speed in FPM using a tachometer. The parameter "DISPLAY D0 → ELEVATOR DATA D1 → SPEED FEEDBACK" shows the actual speed in FPM, as read by the drive.

If the encoder output channels are reversed, the motor will turn slowly and will not be able to go at 60 FPM. The current will be very high and the "SPEED DEV FAULT" will be displayed on the drive display (see section 7.5.1.1 to correct this situation).

When activating PCH, the motor may reach 60 FPM, but the car may go down. It is important to correct this situation (see section 7.5.1.2).

The speed shown on the drive display should be 60 FPM. but is probably not equal to the real measured speed. The following formula determines the motor speed at contract speed to program for the drive speed display equal the read measured speed.

Example:

RPM at "Contract motor speed" of 250 FPM = 1135RPM
Real speed from the hand tachometer (FPM) = 58 FPM
Programmed speed PS1 +PS2 (FPM.) = 60 FPM
Speed to program (RPM) = Speed to write in the drive

$$\text{Speed to program} = \frac{60\text{FPM} \times 1135\ \text{rpm}}{58\ \text{FPM}} = 1174\ \text{RPM}$$

"Contract Mtr Spd"

Change the parameter "ADJUST A0 → DRIVE A1 → CONTRACT MTR SPD" for the new value so the real speed is equal to the one displayed.

After this change the screen will show the real car speed. You will be able to re-adjust this parameter with more precision when you will do fast speed rides.

Modify the wanted speeds according to the following table (ADJUST A0 → MULTI STEP REF A3):

Parameter	Description	Value and explanation	PLC Output
SPEED COMMAND 1	Leveling speed	Example: 7 FPM	PS1 = Activated
SPEED COMMAND 2	Controller inspection speed	Example: 50 FPM	PS2 = Activated
SPEED COMMAND 3	Top of car inspection speed	Example: 75 FPM	PS1 et PS2 = Activated
SPEED COMMAND 4	Preset ref 4	Free	
SPEED COMMAND 5	One floor run speed Elevator at 250FPM and higher	Example: 200 FPM	PS1 et PS4 = Activated
SPEED COMMAND 6	Contract speed	Example: 250 FPM	PS2 et PS4 = Activated

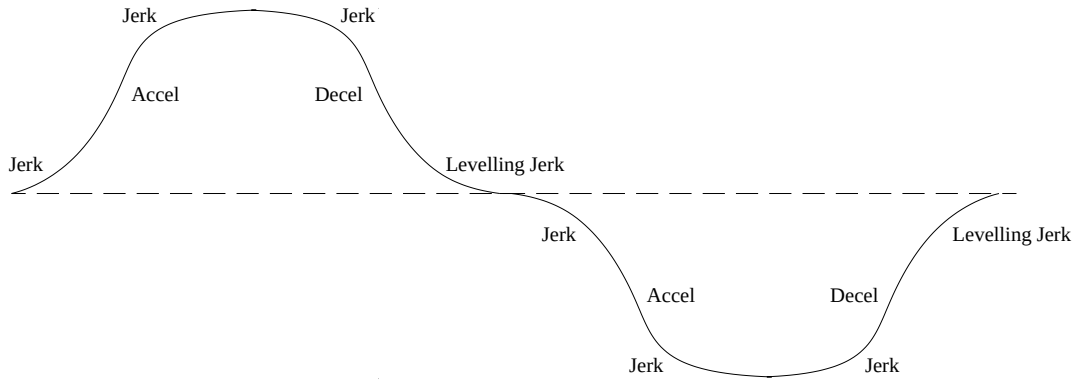
7.5.1.1. The motor does not reach 60 FPM when the PCH signal is activated:

- Remove the controller power and wait 30 seconds.
- Inverse the power conductors T1 and T2 which go to the motor.
- Reset the power and try again.

7.5.1.2. The motor reaches 60 FPM, but the elevator goes down when the PCH signal is activated:

- Remove the controller power and wait 30 seconds.
- Inverse the power conductors T1 and T2 which go to the motor.
- Inverse the encoder signals the following way:
  - ➢ The wire of terminal A+ goes to terminal B+
  - ➢ The wire of terminal B+ goes to terminal A+
  - ➢ The wire of terminal A- goes to terminal B-
  - ➢ The wire of terminal B- goes to terminal A-
- Reset the power and try to move the cabin in Inspection mode. If the elevator goes up when the PCH signal is activated and the motor reaches 60 FPM, stop and return to section 7.5.1 "Programming of operations speeds".

7.5.2. Rounding up factors (S-Curves):



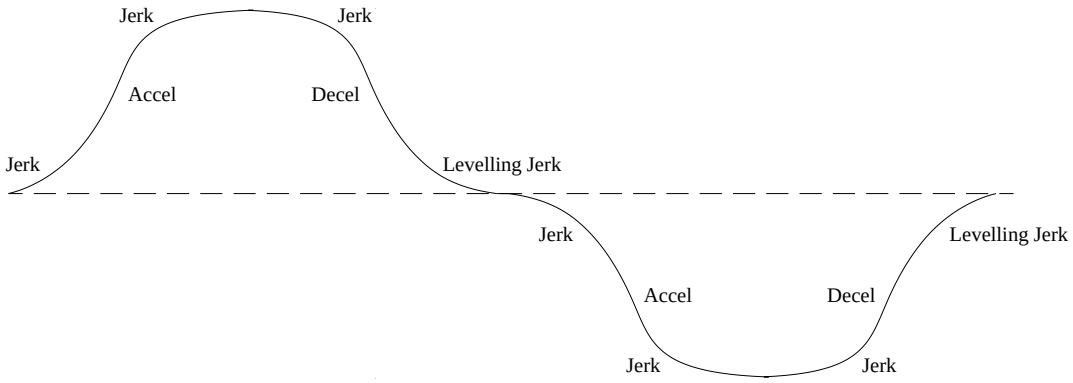
Jerk in: Each of the acceleration and deceleration groups (example: ADJUST A0 → S-CURVE A2 →ACC JERK IN 0) has a rounding up parameter "Jerk" which is applied at the acceleration and at the beginning of the deceleration.

Jerk out: Each of the acceleration and deceleration groups has a final rounding up parameter "Jerk out" which is applied at the end of the deceleration.

Those rounding up factors "Jerk" are in ft/s^3. Start with "8" for rounding up factor in each "Jerk". The more the value is small, the more the corners will be rounded up and the more the speed transitions will be soft. Thus, the deceleration distance will be longer.

The rounding up factor allows to soften the transition between 2 speeds.

7.5.3. Accelerations and decelerations:



All preset speeds must be set properly before adjusting accelerations and decelerations.

The acceleration and deceleration parameters units are in ft/s². Adjust the accelerations and decelerations according to the following table in the menu ADJUST A0 → S-CURVE A2 →:

Parameter	Description	Value and explanation
ACCEL RATE 0	Acceleration rate 0: For 1 floor speed or contract speed if elevator of 250 FPM and less	Example: Speed to reach= 200 FPM ; Speed=200 FPM / 60s = 3.3 ft/s Wanted acceleration=0-200 FPM in 1.5s $\frac{3.3\ pi/s}{1.5s} = 2.2\ pi/s^2$
DECEL RATE 0	Deceleration rate 0: For 1 floor speed or contract speed if elevator of 250 FPM and less	See example of parameter ACCEL RATE 0
ACCEL RATE 1	Acceleration rate 1: Inspection	Example: Speed to reach=60 FPM ; Speed= 60 FPM / 60s = 1 ft/s Wanted acceleration=0-60 FPM in 4.0s $\frac{1pi/s}{4.0s} = 0.25pi/s^2$
DECEL RATE 1	Deceleration rate 1: Inspection	Example: Speed=60 FPM ; Speed=60 FPM / 60s = 1 ft/s Wanted deceleration=60-0 FPM in 0.5s $\frac{1pi/s}{0.5s} = 2pi/s^2$
ACCEL RATE 2	Acceleration rate 2: For contract speed for elevator of 300 FPM and more.	Example: Speed to reach=350 FPM ; Speed=350 FPM / 60s = 5.83 ft/s Wanted acceleration=0-350 FPM in 2.5s $\frac{5.83pi/s}{2.5s} = 2.33pi/s^2$
DECEL RATE 2	Deceleration rate 2: For contract speed for elevators of 300 FPM and more	See the example of parameter ACCEL RATE 2

(To have a faster acceleration, increase the value)

7.5.4. Adjustments to obtain comfortable starts and stops:

The drive may react slowly at brake opening. This slow reaction causes an unpleasant "rollback".

The elevator controller can eliminate this rollback.

The pre-load torque command can also have an important impact at the start.

The PLC program contains timers to ease the elevator start.

Length of ZERO speed delay at start (before and after brake opening):

DM 0045 (0.2 sec.): Time to build the motor electrical field before brake opening.

DM0076 (0.6 sec.): Allowed delay to open the brake completely before the elevator start.

During the DM0045 delay timing, the magnetic field is build up in the motor. After the timer gets the preset value, the brake will begin to open. The DM0076 delay timing is now working. The DM0076 delay must be long enough to be sure the brake did not make any friction when the drive will accelerate the car. If no pre load torque command is given to the drive, you can change the D0076 to make brake dragging "friction" on start to hide and reduce the rolling back.

Length of ZERO speed delay at stop (during and after brake drop):

DM046 (0.8 sec.): This delay represents the time necessary for the elevator to go from 7 FPM to 0 FPM. The brake drops as soon as this delay is expired.

DM0047 (0.8 sec.): This delay represents how much time the motor holds back the elevator while the brake is dropping. The delay in the DM0047 must be long enough to ensure there is no free wheel, even for a fraction of a second, if the brake drops late.

7.5.5. Preload command (PRELOAD TORQUE):

The drive has a +/- 10 Volts dc input to receive a pre-torque signal to remove the rolling back effect at start on brake opening.

- To **activate** the "PRELOAD TORQUE" command, the parameter "CONFIGURE C0 → USER SWITCHES C1 → PRETORQUE SOURCES" must be equal to "ANALOG INPUT".

- To **deactivate** the "PRELOAD TORQUE" command, put the value "None" in the parameter "CONFIGURE C0 → USER SWITCHES C1 → PRETORQUE SOURCES".

The value of the preload torque command can be visualized with the parameter "DISPLAY D0 → ELEVATOR DATA D1 → PRE-TORQUE REF".

Temporarily, increase DM0076 delay to "0020" 2 seconds. This delay will give you time to see the rollback. That pre-torque command can be given to the drive in two different ways.

7.5.5.1. No weighing system with a fix command:

If no charging cell is being used, it is possible to add only one negative or positive fixed command with the parameter "ADJUST A0 → DRIVE A1 → PRE TORQUE BIAS". Load the car with an average weight equal to 3 to 4 persons (between 500 and 800 lbs). Move the elevator up and down. At each departure, when the brake turns on, observe the direction of the inversion on the brake's drum. When the elevator is stopped, change the value of parameter "PRE TORQUE BIAS" (1.5 = -15 %; 2=-20 %). Change the value until there is no more inversion visible on the brake drum. Move the elevator going up and going down to different places in the hoistway for a medium weight. If no significant rolling back is observed, you have finished the adjustments. Finally the value should be between +60% and –60%.

Do not forget to put the original value back in the DM0076.

7.5.5.2. Weighing system with linear output signal:

This type of system generally sends a 0-20 ma or 0-10 volts output signal.

- 0ma = 0 volts = empty elevator.
- 20ma = 10 volts = full load elevator.

Carry out the calibration of the weighing system before adjusting the drive parameters, see the manual supplied by the manufacturer or appendix B is the module is a Micelect.

Once the system is well calibrated, it is possible to adjust the drive parameters.

<u>Proceed to the following steps:</u>

- Empty car, on the Micelect module change R1 alarm and put a value higher than the R3 alarm to turn off the automatic "reset".
- Make a "TARE" on Micelect module to display 0 lbs.
- Put a 40% load inside the car. The elevator should be balanced. If not, add or remove weight from the counterweight.

- Adjust the“Dcor” parameter on the Micelect module to display the real weight in the car.

- Move the car to the middle of the hoistway. Put the controller in inspection mode with the controller switch.

- Go to the first parameter:

➢ Visualize the parameter "ADJUST A0 → DRIVE A1 → PRE TORQUE BIAS".

➢ Move the elevator up and down. The brake will open at each start. Observe the direction of the rollback on the brake drum. When the elevator is stopped, modify the parameter "ADJUST A0 → DRIVE A1 → PRE TORQUE BIAS" so there is no rollback.

- Remove all weights from the car.

- Move the elevator to the middle of the hoistway in inspection mode.

- Go to the second parameter:

➢ Visualize the parameter "ADJUST A0 → DRIVE A1 → PRE TORQUE MULT".

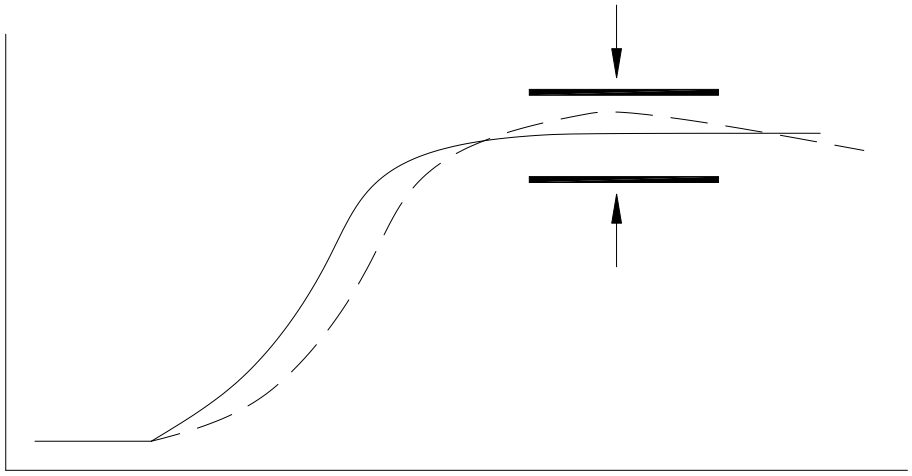
➢ Move the elevator up and down. The brake will open at each start. Observe the direction of the rollback on the brake drum. When the elevator is stopped, modify the parameter "ADJUST A0 → DRIVE A1 → PRE TORQUE MULT". Modify the value until there is no more visible rollback on the brake drums. Move the car up and down at different locations in the hoistway. If there is no apparent rollback, the adjustments are complete.

- On the Micelect module, put back R1 alarm value to the previous value smaller than R3 alarm to re-activate the automatic "reset"

Do not forget to put the original value back in the DM0076.

7.5.6. Speed deviation protection compared to real speed:

Drive speed pattern and elevator speed comparison:



Continuous line: reference signal

Dashed line: real elevator speed

ADJUST A0 → DRIVE A1 → SPD DEV LOW LEVEL:

Factory set to 15%. This is a percentage of the contract speed that determines FPM band around the command speed. The drive processor monitors the elevator speed and if the real speed goes out of that band, a timer begins to count (SPD DEV TIME) If the speed stays out of the band for more than the timing delay, the elevator controller will try to reduce the car speed. After 5 seconds, if the speed is still out of the band, the controller will trip out.

Example:

Contract speed = 200 FPM
15% level = 30 FPM

So, if the elevator speed stays under 170 FPM. or over 230 FPM., the elevator speed will be reduced after the SPD DEV TIME.

ADJUST A0 → DRIVE A1 →SPD DEV TIME:

Factory set to 0.9 sec., this is the time the drive processor will wait before giving a signal to the elevator controller to reduce the speed.

This parameter defines the time limit that the real elevator speed may exceed in reference to the speed drive value.

7.6. Optimal drive adjustment according to the installation "ADAPTIVE TUNE":

The variable speed drive performances depend on the following parameters:

- The motor no load current,
- The motor rated RPM,
- The system inertia,
- The pre-load torque command at brake opening (0-10V load weight system).

The motor no load current is set at 40% to begin. The motor rated RPM is set according to the motor nameplate. The system inertia is set at 1.2 seconds to begin.

With these parameters, the drive will be able to accelerate and decelerate the elevator according to the programmed speeds. You must execute the optimal adjustment of these 4 parameters.

Follow these steps:

Step 1:

- Place the elevator controller in "Maintenance" mode. Place car calls to run the elevator at contract speed. You must measure the real car speed with a hand tachometer. The measured car speed must be equal to the programmed speed.
- If the difference is more than 3 ft / min, you will have to change the following parameter: "ADJUST A0 → DRIVE A1 → CONTRACT MOTOR SPD"
- Increase or decrease the contract motor speed parameter to match the real car speed with the programmed car speed.

Step 2:

- Before running the elevator at full speed, be sure the elevator deceleration distance is short enough to obtain a 3 inches distance at levelling speed (7 ft / min.). Don't worry about the car response as soon as the speed gets 7 ft / min., an under shoot can be observed. That situation will be corrected later.

Step 3:

- If your elevator has a linear output 0-10 volts or 0 –20 ma load weight system, this is the time to do the "ZERO / TARE" adjustment. At this time there is no weight in the elevator. Refer to the load weight device instructions.

Step 4:

- Enter 40% of the full load car capacity in the elevator. Move the elevator at the middle of the hoistway. Remove the power to the controller. Open the brake manually and do the balanced

car test by turning the motor shaft with your hand. Adjust the counterweight if needed. When the elevator is balanced, you can now proceed to the drive Adaptive tune of the drive.

Step 5:

Parameter to estimate: "% NO LOAD CURR"

- Reduce the maximum car speed to 70% of contract speed with a balanced car.

  "ADJUST A0 → MULTISTEP REF A3 → SPEED COMMAND 6"

  Example:

  350 ft / min. X 0.7 = 245 ft / min.

- No load current adjustment "% NO LOAD CURR"

- Access the following parameter: "DISPLAY D0 → POWER DATA D2 →EST NO LOAD CURR"

- Do a multiple floor ride and write down the value shown in the parameter "EST NO LOAD CURR". When the elevator will be stopped, you need to write that value in the following operation parameter:

  "ADJUST A0 → MOTOR A5 → % NO LOAD CURR"

- Do others rides and change at every stop the no load current. The no load current will be optimal when the value will be contained in a 2% range. When it is done, you can go to the next step.

Step 6:

Parameter to estimate: "RATED MTR SPEED"

- Now, put back the contract speed as the maximum elevator speed:

  "ADJUST A0 → MULTISTEP REF A3 →SPEED COMMAND 6"

  Enter 70% to 100% of the full load car capacity in the elevator.

- If your elevator has a linear output 0-10 volts or 0 –20 ma load weight system, this is the time to do the known load / span / full load adjustment. Now, there is a known weight value in the elevator. Refer to the load weight device instructions.

- Motor RPM adjustment "RATED MTR SPEED"

- Access the parameter: "DISPLAY D0 → POWER DATA D2 → EST RATED RPM"

- Do a multiple floor ride and write down the value shown in the parameter "EST RATED RPM". When the elevator will be stopped, you need to write that value in the following operation parameter:

  "ADJUST A0 → MOTOR A5 → RATED MTR SPEED"

- Do others rides and change at every stop the rated motor speed. The rated motor speed will be optimal when the value will be contained in a 3 RPM range. When it is done, you can go to the next step.

Step 7:

Parameter to estimate: "INERTIA"

- Remove in car weight up to 40% to balance the car again.

  The next test will be done at full speed.

- System inertia adjustment "INERTIA"

- Access the parameter: "DISPLAY D0 → ELEVATOR DATA D1 → EST INERTIA"

- Do a multiple floor ride and write down the value shown in the parameter "EST INERTIA". When the elevator will be stopped, you need to write that value in the following operation parameter

  "ADJUST A0 → DRIVE A1 → INERTIA"

- Do others rides and change at every stop the system inertia. The system inertia will be optimal when the value will be near the estimated value. When it is done, you can go to the next step.

  If the controller did not have a linear output weight system, you have finished the optimal drive parameter adjustment. Return to the ACCEL / DECEL section to finish the floor stop and levelling distance.

Step 8:

Actually, the elevator is balanced. If your elevator has a linear output 0-10 volts or 0 –20 ma load weight system, this is the time to do the drive pre torque parameter adjustment.

- Verify if "PRE TORQUE SOURCE" parameter is equal to "ANALOG INPUT". Acces to the paratmeter: "CONFIGURE CO → USER SWITCHES C1 → PRE TORQUE SOURCE" press "ENTER" and find "ANALOG INPUT".

- Move the elevator in the middle of the hoistway. Switch the controller in "INSPECTION" mode.

- Access the parameter: "ADJUST A0 → DRIVE A1 → PRE TORQUE BIAS"

- Do up and down direction movements. At each start "when brake open", check the rolling back on the brake drum. When the elevator is stopped, change the pre torque bias operation parameter. Change the value up you will not see any rolling back on the brake drum. Start and stop in both direction at different places in the hoistway. If no significant rolling back is observed, go to next step.

Step 9:

Remove all the weight in the elevator. If your elevator has a linear output 0-10 volts or 0–20 ma load weight system, this is the time to do the drive pre torque parameter adjustments.

- Move the elevator in the middle of the hoistway. Switch the controller in "INSPECTION" mode.

- Access the parameter: "ADJUST A0 → DRIVE A1 → PRE TORQUE MULT"

- Do up and down direction movements. At each start "when brake open", check the rolling back on the brake drum. When the elevator is stopped, change the pre torque multiplier operation parameter.

- If the elevator moves in the down direction when the brake opens, the multiplier is too high. Reduce it. Change the value up you will not see any rolling back on the brake drum. Start and stop in both direction at different places in the hoistway. If no significant rolling back is observed, you have finished the adjustments.

7.7. Full load testing and slip frequency final adjustment:

If section 7.6 was performed before, this section is optional. Do it only if you are having problems with the re-levelling.

For this test, it is important to run the elevator full load. Put the weights in the car.

To simplify the test, change the inspection speed and program it equal to the levelling speed. Move the car in inspection at slow speed at the bottom and at the top floor.

New motor with low slip frequency:

Parameter "ADJUST A0 → MOTOR A5 → RATED MTR SPEED" is factory set according to the motor data received. This parameter indicates the motor slip frequency according to the synchronous speed (900, 1200, and 1800).

Low slip frequency motors as RPM near the synchronous speed.

Increase or decrease this parameter to be sure that the elevator will be able to move full load without any problem at slow speed everywhere in the hoistway.

New or old motor with high slip frequency:

Usually these are 1 or 2 speed AC motors. These high slip motors require more current to run without a load.

The parametere "ADJUST A0 → MOTOR A5 → % NO LOAD CURR" must be between 50 % and 60 % for this type of motor.

The parameter "ADJUST A0 → MOTOR A5 → RATED MTR SPEED" has been programmed in factory with a starting value. This parameter indicates to the drive the motor's slip frequency according to the synchrone speed (900, 1200, 1800).

The slip of the motor will increase in accordance with the augmentation of the distance between the RPM motor and the synchronous speed. A 1050RPM/1200 motor speed is frequent.

Increase or decrease this parameter if necessary to ensure the elevator will run smoothly, at low speed and fully loaded anwhere in the hoistway.

7.8. Overspeed test 125%:

- Put the car in Maintenance mode and send the car to the top floor.
- Use the arrows to find the sub-menu "ADJUST A0 → DRIVE A1 → CONTRACT MOTOR SPD" which corresponds to the contract speed.
- Note of the speed in RPM to reach the contract speed. That value has to be put back to its original value at the end of the test.

  Example for an application of a 300FPM contract speed:

  300 FPM X 1.25 = 375 FPM (speed at which the governor will be activated)
  If 1160 RPM(motor) = 300 FPM(1160 RPM is the speed entered in parameter CONTRACT MOTOR SPD)
  X RPM = 375 FPM
  So, 1160 X 375/300 = 125 RPM + 20 RPM to activate the governor

- Press the "ENTER" key and use arrow keys to enter 1470 RPM. Press "ENTER" to save the value.
- Elevators running over than 200 FPM require an "Emergency Terminal Stopping Device" system. Another processor computes the actual speed of the car from the motor encoder. This processor has a built in 115% over speed protection.

7.8.1. Parameters modification to reach 125% with elevator of more than 200FPM:

Elevators going faster than 200 FPM have an emergency stopping device at top and bottom floors. Another processor calculates the elevator's actual speed using the

perforated tape or the governor encoder. This processor has an over speed protection activating at 115% of the contract speed.

To be able to accelerate the elevator at 125%, change the parameter "D14" (contract speed) in the processor CP1L (example: 300 FPM X 1.27=381 FPM).

Do as followed with the LCD screen, (connect the LCD on the CP1L PLC):

- Press "ESC" and the "UP/DOWN" keys to select "REGISTER ACCESS".
- Press "ENTER".
- Choose "DM" for register type.
- Press "ENTER".
- Press the "LEFT/RIGHT" and "UP/DOWN" keys to enter 0014.
- Press "ENTER"
- Press "ENTER" to modify the value, enter the new value (example:0381) and press "ENTER" to save the modification.
- Be prepared to note the real speed with the tachometer. Place a car call to the bottom floor.

Do not forget to put back the original values in the drive's parameters "ADJUST A0 → DRIVE A1 → CONTRACT MOTOR SPD". Also, for the elevators of 200 FPM and more, put back DM 14 in the CP1L processor, to its original value.

8. CONTROL TECHNIQUES (SP / M) DRIVE START-UP:

8.1. Connections:

8.1.1. Isolation transformer connections:

If your elevator control package includes an isolation transformer, maintain the drive input voltage between 5 to 10 Volts around the drive supply voltage. Example: 450 to 470 Volts for 460 Volts drive input. Select the appropriate transformer taps at the primary side.

For safety reasons, the terminal "X0" must be grounded.

Refer to section 8.1.3 (Motor connections).

8.1.2. Encoder connections:

The current drive program requires the installation of an encoder to operate. The encoder's multi-wire conductor must be isolated in a pipe in order to eliminate any electrical interference on power lines. This conductor must be shielded. The shield is connected on the "ESHD" terminal in the elevator controller. Connect the encoder as indicated in the drawings supplied with the controller.

Care must be taken for the encoder alignment on the motor shaft. Vibrations will cause ripples in the speed regulations and reduce the encoder life.

8.1.3. Motor connections:

Connect the motor leads to terminals or on power contactor T1, T2, and T3 in the controller.

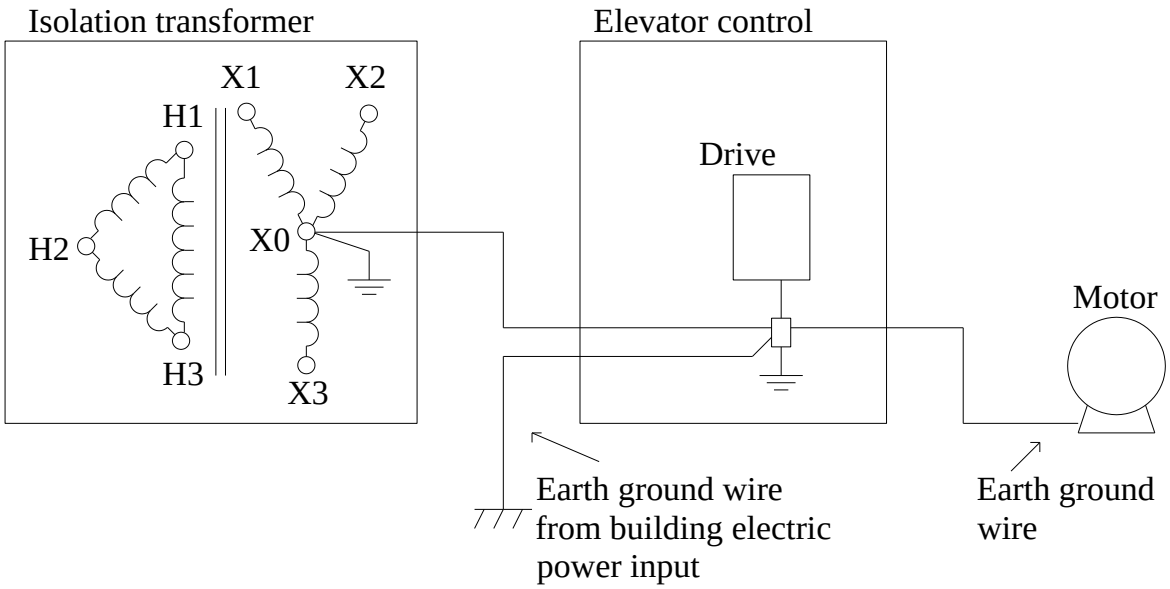
Refer to the motor nameplate for the appropriate voltage connection.

If the motor has a temperature switch, it must be connected according to the schematic.

If the motor does not have a temperature switch deactivate the option by putting DM0183 at 1234.

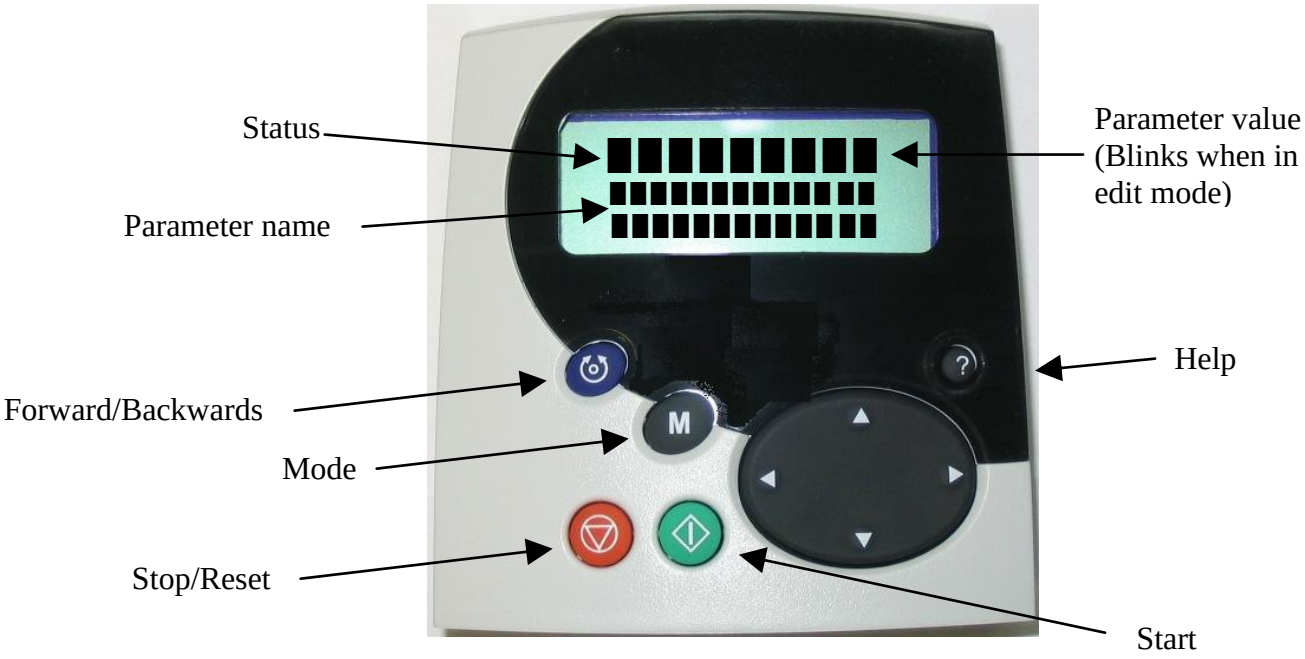
WARNING

The grounding conductors must be connected as followed:



8.2. Functionning of the drive:

8.2.1. Drive keyboard operation (SP):



The left and right arrows allow access to the main menus or to position the cursor on the number to modify in edit mode. The "Control Techniques" drive has 23 menus from 0 to 22. The menu 0 is a summary of all the other menus and it was build for the elevator controller.

The up and down arrows give access to the principal menus' sub-menus (parameters) or give access to the parameters of the selected sub-menu. They also allow changing a parameter value in edit mode.

Example:

Parameter 3.02, the 3 represents the menu and 02 represents the parameter of menu 3. To have access, press the up and down arrows.

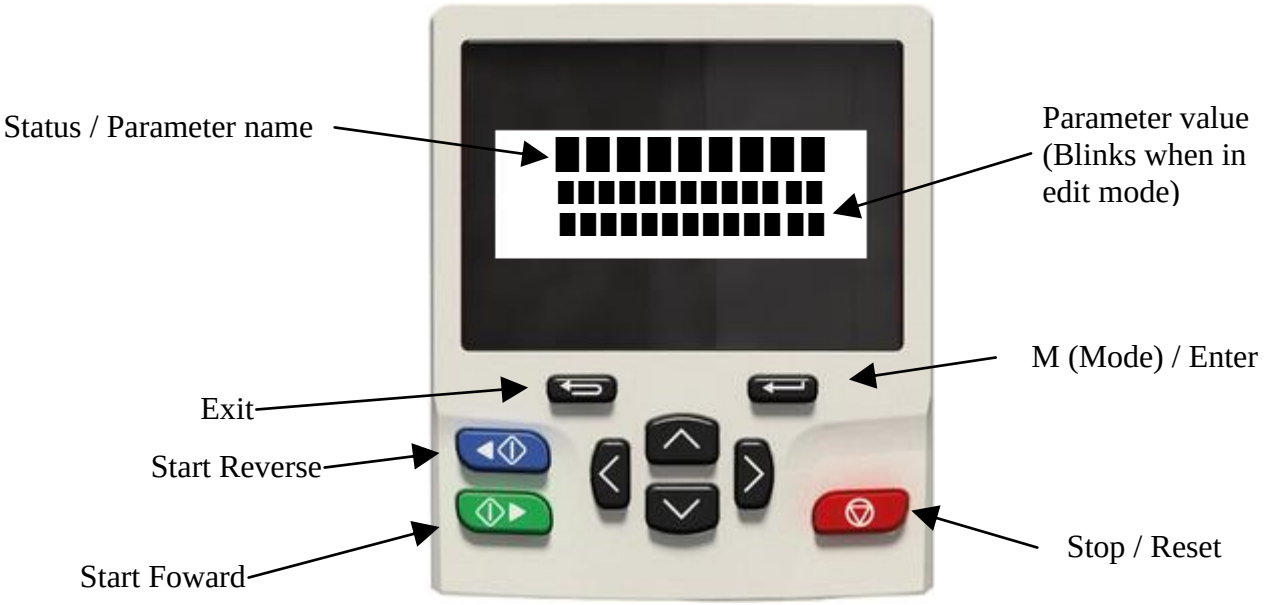
The key "M" allows alternating between the visualizing mode and the edit mode to modify a parameter.

The keys "Start" and "Forward/Backwards" are not used.

The key "Help" allows to show help info on a selected parameter. When the info is displayed, the up and down arrows allows to scroll through the text.

The key "Stop/Reset" allows resetting the drive. It will also be used for saving purposes, as describes later on.

8.2.2. Drive keyboard operation (M):



The left and right arrows allow access to the main menus or to position the cursor on the number to modify in edit mode. The "Control Techniques" drive has many menus. The menu 0 is a summary of all the other menus and it was build for the elevator controller.

The up and down arrows give access to the principal menus' sub-menus (parameters) or give access to the parameters of the selected sub-menu. They also allow changing a parameter value in edit mode.

Example:

Parameter 3.002, the 3 represents the menu and 002 represents the parameter of menu 3. To have access, press the up and down arrows.

The key "M" or "Enter" allows alternating between the visualizing mode and the edit mode to modify a parameter.

The keys "Start Foward" and "Start Reverse" are not used.

The key "Stop/Reset" allows resetting the drive. It will also be used for saving purposes, as describes later on.

8.2.3. Modifying a drive parameter:

Use the following sequence is to modify a drive parameter:

- Use the left and right arrows to find the desired menu (example "0").
- Use the up and down arrows to find the parameter to modify (example "0.45") and press the key "M" or "Enter" to switch to edit mode. The parameter value must be blinking. Press again on the key "M" or "Exit"to exit the Edit mode without making any modification.
- When the parameter to modify contains several options, use the up and down arrows to select an option (example "SC.EnDat"). If the parameter is a numeric value, use the left and right arrows to position the cursor on the number to modify (example "0070") and use the up and down arrows to change the value.
- Once the value is correct, press the key "M" or "Enter" to save the new value and exit the Edit mode.

8.2.4. Save drive parameters (SP):

Do the following sequence to save permanently the values:

Enter 1000 in the parameter 0.00 (SP):

- Using the left and right arrows, find the menu "0.yy";
- Using the up and down arrows, find the parameter "0.00" and press "M" to enter the Edit mode.
- Using the left and right arrows, place the cursor on the number to modify.
- Using the up and down arrows, change the value of the number and enter 1000.
- Press "M" to save the modifications and exit the Edit mode.
- Press the red "Stop/Reset" button. The value 1000 becomes 0 and the parameters are saved.

8.2.5. Save drive parameters (M):

Do the following sequence to save permanently the values:

Select "Save parameters" in the parameter 0.000 (M):

- Using the left and right arrows, find the menu "0.yy";
- Using the up and down arrows, find the parameter "0.00" and press "Enter" to enter the Edit mode.
- Using the up and down arrows, select "Save parameters".
- Press "Enter" to save the modifications and exit the Edit mode.
- Press the red "Stop/Reset" button. The value "Save parameters" becomes "No action" and the parameters are saved.

8.2.6. Accessing the error messages list:

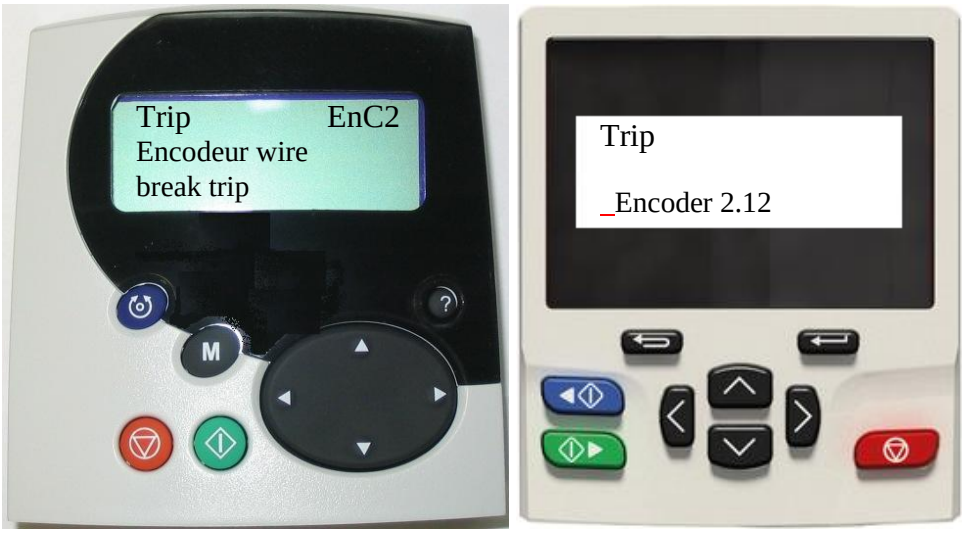
The variable speed drive indicates two classes of events: faults and alarms.

Faults:

When a fault occurs, the drive stops and the brake drops. The screen light will blink. The word "Trip" will appear in the top left corner of the screen and the fault will appear in the top right corner of the screen. The fault description will appear in the bottom lines of the screen.

To erase faults:

First of all, the fault must be corrected before it is erase from the drive's memory. Then press the red "Stop Reset" button.



The content of parameters 10.20 to 10.29 for the "SP" drive and 10.020 to 10.029 for the "M" drive indicates the 10 most recent faults, 10.20 or 10.020 being the last one to occur.

To visualize the faults:

For the complete fault description, see the drive user's manual.

Alarms:

Contrarily to faults, alarms do not trigger a stop and do not stop the drive from starting. Any active alarm will appear on the operating screen. The message will be erased automatically when the alarm disappears.

For a complete alarm description, see the drive user's manual.

8.3. Programming of the encoder and motor parameters:

If the motor parameters have been sent to Automatisation JRT Inc., this section will have been programmed at the factory. However, it is strongly recommended to verify these parameters directly on site.

8.3.1. Encoder parameters:

DRIVE ENCODER TYPE (0.50 "SP") (0.060 "M"):

This parameter contains the type of encoder that is used. For almost all asynchrone motors, the type of encoder is AB (check with the controller's schematic). Then, the encoder counts should be visible in parameter 0.52 in the "SP" drive and 0.063 in the "M" drive.

DRIVE ENCODER SUPPLY VOLTAGE (0.51 "SP") (0.061 "M"):

This parameter is the encoder power source put 5V.

NUMBER OF ENCODER LINES / REVOLUTION (0.53 "SP") (0.062 "M")

This parameter contains the number of pulses per encoder revolution (check with the encoder, generally 1024 or 2048).

8.3.2. Motor parameters:

The following parameters can be obtained by reading the motor nameplate:

NUMBER OF MOTOR POLES (0.42 "SP") (0.047 "M") :

This parameter contains the number of motor poles.

$$\text{Number of poles} = \frac{120 \text{ Degrees X frequency Hz}}{\text{RPM motor}} = \frac{120 \text{ Degrees X } 60\text{Hz}}{1800} = 4 \text{ poles}$$

- 900 RMP at 60Hz = 8 poles
- 1200 RMP at 60Hz = 6 poles
- 1800 RMP at 60Hz = 4 poles

RATED VOLTAGE (0.44 "SP") (0.049 "M") :

This parameter contains the motor voltage (Example: 460 Volts)

MOTOR RATED CURRENT (0.46 "SP") (0.050 "M") :

This parameter contains the motor current indicated on the motor nameplate or on the data sheet given by the motor supplier (Example: 6.6 AMP).

MOTOR LOAD RPM/RATED SPEED (0.45 "SP") (0.048 "M") :

The motor speed corresponds to the one written on the nameplate. (Example: 1180 RPM). The speed corresponds to the synchronous motor speed minus the motor slip. So, if you want to inscribe 50 RPM of slip on a 1200 RPM motor, then inscribe 1150 RPM.

MOTOR MAXIMUM SPEED (0.02 "SP") (0.019 "M") :

Motor maximum speed. (Example: 1200 RPM)

Begin with the value 0.45 or 0.048 +10% (Example 1200 RPM * 110/100 = 1320 RPM)

8.4. Programming the motor “autotune”:

It is important to check the encoder and motor parameters before doing the "Autotune".

In case of emergency, always be ready to turn off the main power supply switch during the drive’s first trials.

AUTOTUNE (0.40 "SP") (0.045 "M") (Stationnary):

When set to 1, this parameter allows to calculate, at the next drive activation, the resistance, the motor inductance as well as the motor’s current gains.

First note the value of the PLC’s DM49 with the programming tool or the LCD.

- Press "ESC" and the "UP/DOWN" keys to choose "REGISTER ACCESS".
- Press "ENTER".
- Choose "DM" for register type.
- Press "ENTER".
- Press the "LEFT/RIGHT" and "UP/DOWN" keys to enter 0049.
- Press "ENTER".
- Press "ENTER" to modify the value, enter the new value 0500 and press "ENTER" to save the modification.

Put "1" in the parameter, place the elevator in controller inspection mode, use a jumper between +A and PCH or control inspection (put a jumper between +A and ISR to activate control inspection) press ▲or▼ on the control inspection circuit and hold it until parameter indicates 0. The test is now complete. **Save in the drive and put back the old value in DM49.**

8.4.1. "Trip TunE" or "Trip Autotune stopped" fault during the "Autotune":

The "Autotune" has been stopped before being completed. Check the jumper between +A and PCH or PCB. Check if the controller is in trouble; see the LCD and the manual's alarms section. Redo the "Autotune".

8.4.2. Drive "Trip ENC2" or "Trip Encoder 2.xx" fault:

Check the encoder cabling and power supply. The drive does not detect the encoder.

8.5. Programming the speed drive gains:

Automatisation JRT Inc has programmed these parameters. However they can be modified in order to obtained optimum elevator performances.

8.5.1. Speed drive gain:

The drive has proportional gain, integral gain and differential gain (Kp1, Ki1 and Kd1).

As the following table:

Parameter	Description	Value and explication
0.07 or 0.007	Speed controller P gain 1 (Kp1). Proportional	**0.2000** (1/rad s-1): generally between 0.1000 and 0.6000 per step of 0.05. If the value is too low, the speed will not be constant(See param. 0.10 on the drive). If it is too high, there will be vibrations in the motor and its noise will be louder.

Parameter	Description	Value and explication
0.08 or 0.008	Speed controller I gain 1 (Kil). Integral	**1.000** (1/rad): generally between 1 and 8 per step of 0.5 or 1. If the value is too low, there will be an important speed fault during speed changes, for example at the end of the deceleration (see param. 3.03 on the drive). Also the elevator will have an important "ROLL BACK". It can be raised of about 5 to diminish that effect. If it is too high, there will be vibrations in the motor and its noise will be louder.
0.09 or 0.009	Speed controller D gain 1 (Kd1). Differential	**0.0500** (sec): generally between 0.00 and 0.25 per step of 0.02, deletes the "Overshoots" and the "Undershoot". If the value is too high, there will be some IMPORTANT vibrations in the motor and its noise will be louder. It is rarely necessary to change it.

8.5.2. Speed drive current gain (Nervous or loud motor):

The drive has two current gains, one is proportional and the other is integral. They are the "0.38" and "0.39" parameters for the "SP" drive and "0.052" and "0.053" for the "M" drive. These gains are calculated during the "Autotune". But, they can be lowered down to 200 for both gains (lower down by scales 0f 300). Gains that are too high can cause a vibration and excessive noise in the motor.

8.6. Speed, acceleration/deceleration parameters programming:

8.6.1. Programming of operations speeds:

Connect all the signals necessary in order to move the elevator in the desired mode. The car top inspection speed PS1 + PS2 is set to 60 FPM during manufacturing.

Compare the wanted speed with the parameter "FREQUENCY/SPEED REFERENCE SELECTED 0.11 or 0.011" and the actual motor speed, parameter "SPEED FEEDBACK 0.10 or 0.010". The speeds are in RPM.

Try to move the car in inspection mode and note the car's actual speed in FPM using a tachometer. The parameter "SPEED FEEDBACK 0.10 or 0.010" shows the actual speed in RPM, as read by the drive.

If the encoder signals are reversed, the motor will turn slowly and won't reach 60 FPM. The motor current will be very high (see section 8.6.1.1 to correct the situation).

When activating PCH, the motor may reach 60 FPM, but the car may go down. It is important to correct this situation (see section 8.6.6.2).

Modify the wanted speeds according to the following table:

Parameter	Description	Value and explication	PLC output
0.20 or 0.020	Preset ref 1: Zero electric	0 RPM	No output

Parameter	Description	Value and explication	PLC output
0.21 or 0.021	Preset ref 2: Leveling speed	Example: Motor 1175 RPM; Contract speed= 350 FPM Wanted leveling speed= 7 FPM $\frac{7\,pi/\min \times 1175\,RPM}{350\,pi/\min} = 23.5 RPM$	PS1 = Activated
0.22 or 0.022	Preset ref 3: Controller inspection	Example: Motor 1175 RPM; Contract speed = 150 FPM Wanted inspection speed= 50 FPM $\frac{50\,pi/\min \times 1175 RPM}{150\,pi/\min} = 392 RPM$	PS2 = Activated
0.23 or 0.023	Preset ref 4: Car top inspection	Example: Motor 1175 RPM ; Contract speed = 200 FPM Wanted inspection speed= 75 FPM $\frac{75\,pi/\min \times 1175 RPM}{200\,pi/\min} = 440 RPM$	PS1 et PS2 = Activated
0.24 or 0.024	Preset ref 5:	Free	
0.25 or 0.025	Preset ref 6: 1 floor If elevator of 250 FPM and more	Example: Motor 1175 RPM; Contract speed = 350 FPM Wanted 1 floor speed=200 FPM $\frac{200\,pi/\min \times 1175 RPM}{350\,pi/\min} = 671 RPM$	PS1 et PS4 = Activated
0.26 or 0.026	Preset ref 7: Contract	Example: Motor 1175 RPM; 1175 RPM and if needed adjust with the tachometer	PS2 et PS4 = Activated

When the adjustments are done save the parameter

8.6.1.1. The motor does not reach 60 FPM when the PCH signal is activated:

- Remove the controller power and wait 30 seconds.
- Inverse the power conductors T1 and T2 which go to the motor.
- Reset the power and try again.

8.6.1.2. The motor reaches 60 FPM, but the elevator goes down when the PCH signal is activated:

- Remove the controller power and wait 30 seconds.
- Inverse the power conductors T1 and T2 which go to the motor.
- Inverse the encoder signals the following way:
  - The wire of terminal A+ goes to terminal B+

- The wire of terminal B+ goes to terminal A+
- The wire of terminal A- goes to terminal B-
- The wire of terminal B- goes to terminal A-

- Reset the power and try to move the cabin in Inspection mode. If the elevator goes up when the PCH signal is activated and the motor reaches 60 FPM, stop and return to section 8.6.1 "Programming of operations speeds".

8.6.2. Slip adjustment (Old motor):

MOTOR RATED SPEED (0.45 "SP") (0.048 "M") (Slip adjustement)

It indicates the synchronous speed of the motor minus the motor slip. This value is generally between 1 and 3% of the synchronous speed.

- New motors:

  Inscribe the value of the name plate.

  Example:

  1175 RPM for a 6 poles motor. (Slip of 25 RPM)

- Old motors 1 or 2 speed AC with or without and encoder:

  These motors have a strong slip and often 1200 RPM is inscribed on the name plate. This value is generally between 3 and 10 % of the synchronous speed.

  Example:

  1200 – (1200RPM X 5%) = 1140 RPM

  Motor Rated Speed = 1140 RPM to start the test.

  If the value of the programmed slip frequency does not correspond to the motor, it will not developpe enough torque to get the elevator to go up and down with a full charge at low speed.

  ATTENTION

  If the slip frequency is too high, the current exit of the variator will be too high even if the motor runs well. If the current stays under the nominal current of the motor for more then 3 ampere when the cab is empty at high speed, reduce the slip frequency. The current should go back below the nominal current at high speed.

POWER RATED FACTOR (0.43 "SP") (5.010 "M")

This parameter corresponds to the power factor of the motor, this means at the phase difference between the motor tension and the current of the motor. The default value is 0.85, but on certain old motors, if they do not follow instruction of are not constant, reduce the value by step of 0.02. This value must be included between 0.60 and 0.85.

8.6.3. Rounding up factors (S-Curves):

The rounding up factor allows obtaining a comfortable transition between 2 speeds. Adjust as followed:

Parameter	Description	Value and explication
0.28 or 0.028	S ramp acceleration limit	0.5 s²/1000 RPM: generally between 0.25 and 1.5 per step of 0.25 or 0.5 according to the wanted comfort. The higher the value is, the more the roundup is accentuated. The softer the acceleration and deceleration the more important the acceleration and deceleration distance will be.

8.6.4. Accelerations and decelerations:

Every speed must be programmed correctly before making any adjustments to the accelerations and decelerations.

The units for the accel/decel parameters are in sec/1000Rpm. Adjust the accelerations and decelerations as followed:

Parameter	Description	Value and explication
0.03 or 0.034 ("M")	Acceleration rate 1: For 1 floor speed or contract speed if elevator of 250 FPM and less	Example: Motor 1175 RPM; Speed to reach= 200 FPM Wanted Acc/Dec = 0-200 FPM in 1.8s $\frac{1.8s \times 1000RPM}{1175RPM} = 1.53s/1000RPM$
0.04 or 0.035 ("M")	Deceleration rate 1: For 1 floor speed or contract speed if elevator of 250 FPM and less	See example with parameter 0.03
0.16 or 0.036 ("M")	Acceleration rate 2: Inspection	Example: Motor 1175 RPM; Inspection speed= 50 FPM Wanted Acc/Dec = 0-50 FPM in 4s $\frac{4s \times 1000RPM}{73RPM} = 3.40s/1000RPM$
0.17 or 0.037 ("M")	Deceleration rate 2: Inspection	Example: Motor 1175 RPM; Inspection speed= 50 FPM Wanted Acc/Dec = 50-0 FPM in 0.5s $\frac{0.5s \times 1000RPM}{1175RPM} = 0.43s/1000RPM$
0.18 or 0.038 ("M")	Acceleration rate 3: For contract speed for elevator of	Example: Motor 1175 RPM; Speed to reach= 350 FPM

	300 FPM and more.	Wanted Acc/Dec = 0-350 FPM in 2.5s $\frac{2.5s \times 1000RPM}{1175RPM} = 2.04s/1000RPM$
0.19 or 0.039 ("M")	Deceleration rate 3: For contract speed for elevator of 300 FPM and more.	See example with parameter 0.18

8.6.5. Adjustments to obtain comfortable starts and stops:

The drive may react slowly at brake opening. This slow reaction causes an unpleasant "rollback".

The elevator controller can eliminate this rollback.

The pre-load torque command can also have an important impact at the start.

The PLC program contains timers to ease the elevator start.

Length of ZERO speed delay at start (before and after brake opening):

DM 0045 (0.2 sec.): Time to build the motor electrical field before brake opening.

DM0076 (0.6 sec.): Allowed delay to open the brake completely before the elevator start.

During the DM0045 delay timing, the magnetic field is build up in the motor. After the timer gets the preset value, the brake will begin to open. The DM0076 delay timing is now working. The DM0076 delay must be long enough to be sure the brake did not make any friction when the drive will accelerate the car. If no pre load torque command is given to the drive, you can change the D0076 to make brake dragging "friction" on start to hide and reduce the rolling back.

Length of ZERO speed delay at stop (during and after brake drop):

DM046 (0.8 sec.): This delay represents the time necessary for the elevator to go from 7 FPM to 0 FPM. The brake drops as soon as this delay is expired.

DM0047 (0.8 sec.): This delay represents how much time the motor holds back the elevator while the brake is dropping. The delay in the DM0047 must be long enough to ensure there is no free wheel, even for a fraction of a second, if the brake drops late.

8.6.6. Pre-load torque command ("PRELOAD TORQUE"):

The drive accepts a signal of +/- 10 volts as its preload torque to eliminate rollbacks at brake opening.

- To **activate** the "PRELOAD TORQUE", the parameter "TORQUE MODE SELECTOR (4.11 or 4.011)" must be equal to "FEED FWD (4)".

- To **deactivate** the "PRELOAD TORQUE", put the value "SPEED(0)" in the parameter "TORQUE MODE SELECTOR (4.11 or 4.011)".

The value of the preload torque command can be visualized through the parameter "TORQUE REFERENCE (0.33 "SP") (0.074 "M")

Temporarily increase the delay in the DM0076 to 2 seconds "0020". This will allow to better see the rollback at brake opening. The preload torque command sent to the drive can come from two types of interface.

8.6.6.1. No weighing system with a fixed command:

If no charging cell is being used, it is possible to add only one negative or positive fixed command with the parameter "T7 ANALOG INPUT 2 OFFEST (0.34 "SP") (0.075 "M")". Load the car with an average weight equal to 3 to 4 persons (between 500 and 800 lbs). Move the elevator up and down. At each departure, when the brake turns on, observe the direction of the inversion on the brake's drum. When the elevator is stopped, change the value of the parameter "T7 ANALOG INPUT 2 OFFSET (0.34 "SP") (0.075 "M")". Change the value until there is no more inversion visible on the brake drum. Move going up and going down to different places in the hoistway for a medium weight. If no significant rolling back is observed, you have finished the adjustments. Finally the value should be between +60% and –60%. There will be a rollback when the car has a full load. However the rollback distance may be smaller by increasing the gain "Kil (0.08 "SP") (0.008 "M")" (see the section on the gain adjustments). Save the drive's new parameters.

For the "SP" drive, the preload command depends on parameter "0.59" (Inversion direction). So, if parameter "0.59" is changed, the command direction must be inversed (-40% will become +40%).

Do not forget to put the original value back in DM0076.

8.6.6.2. Weighing system with linear output signal:

This type of system generally sends a 0-20 ma or 0-10 volts output signal.

- 0ma = 0 volts = empty elevator.
- 20ma = 10 volts = full load elevator.

Carry out the calibration of the weighing system before adjusting the drive parameters, see the manual supplied by the manufacturer or appendix B is the module is a Micelect.

Once the system is well calibrated, it is possible to adjust the drive parameters.

Proceed to the following steps:

- Empty car, on the Micelect module change R1 alarm and put a value higher than the R3 alarm to turn off the automatic "reset".

- Make a "TARE" on Micelect module to display 0 lbs.

- Put a 40% load inside the car. The elevator should be balanced. If not, add or remove weight from the counterweight.

- Adjust the“Dcor” parameter on the Micelect module to display the real weight in the car.

- Move the car to the middle of the hoistway. Put the controller in inspection mode with the controller switch.

- Go to the first parameter:

  - Visualize the parameter "T7 ANALOG INPUT 2 OFFSET (0.34 "SP") (0.075 "M")".

  - Move the elevator up and down. The brake will open at each start. Observe the direction of the rollback on the brake drum. When the elevator is stopped, modify the parameter " T7 ANALOG INPUT 2 OFFSET (0.34 "SP") (0.075 "M")" so there is no rollback.

- Remove all weights from the car.

- Move the elevator to the middle of the hoistway in inspection mode.

- Go to the second parameter:

  - Visualize the parameter "T7 ANALOG INPUT 2 SCALING (7.12 "SP") (0.076 "M")".

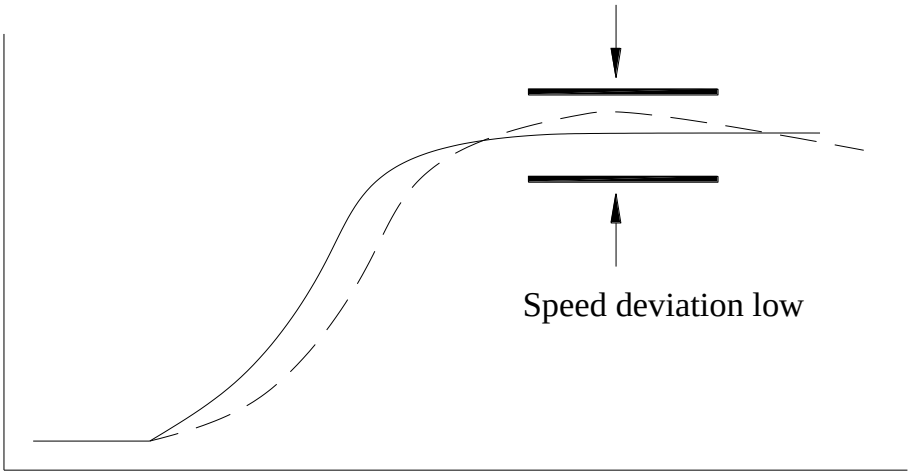
  - Move the elevator up and down. The brake will open at each start. Observe the direction of the rollback on the brake drum. When the elevator is stopped, modify the parameter " T7 ANALOG INPUT 2 SCALING (7.12 "SP") (0.076 "M")". Modify the value until there is no more visible rollback on the brake drums. Move the car up and down at different locations in the hoistway. If there is no apparent rollback, the adjustments are complete. Save the drive’s new parameters.

- On the Micelect module, put back R1 alarm value to the previous value smaller than R3 alarm to re-activate the automatic "reset"

Do not forget to put the original value back in the DM0076 and save drive parameters.

8.6.7. Speed deviation problem detection compared to real speed:

Drive speed pattern and elevator speed comparison:



Continuous line: reference signal

Dashed line: real elevator speed

"SPEED DEVIATION"

Factory set to 200RPM. The drive processor monitors the elevator speed and if the real speed goes out of that band, a timer begins to count. If the speed stays out of the band for 1 second, the elevator speed will be reduced. After 5 seconds, if the speed is still out of the band, the controller will stop the elevator.

The parameter "APPLICATION MENU 1 RW INTEGER (0.54 "SP") (0.055 "M")" holds the value of the allowed deviation. So, if the elevator speed becomes under or over 200RPM, the elevator speed will be reduced after the 1 second.

Adjust between 10 and 20% of the contract speed in RPM. Save the new parameter.

8.7. Smartcard (0.30 "SP") (0.001 "M"):

There is a smart card behind the drive's operator screen. It allows, for example, to copy data from one drive to the other, in the case of a duplex or group. This saves time and avoids forgetting one or many parameters. So, once the first elevator is adjusted, the card allows to transfer all of the parameters modified to the other drives. It is, however, necessary to carry out again the Autotune, since some parameters may differ.

If the data copy of one elevator to another is done after the "Autotune", take note of the parameters "0.36, 0.37 0.38" and "0.39" (current gain) for the "SP" Drive and "5.017, 5.024 0.052" and "0.053" (current gain) for the "M" Drive. Copy the data and reset the original values of those 4 parameters.

8.7.1. Saving the smartcard:

- Use the left and right arrows to find the menu "0.yy".
- Use the up and down arrows to find the parameter (0.30 "SP") (0.001 "M") and press "M" or "Enter" to enter the edit mode.
- Use the up and down arrows to select "Prog" or "Program".
- Press "M" or "Enter" to save the new value and exit the edit mode.
- Press the red button "Stop/Reset", the word "Prog" or "Program" becomes "None" and the parameters are saved in the smartcard.

8.7.2. Changing the drive parameters from the smartcard:

- Use the left and right arrows to find the menu "0.yy".

- Use the up and down arrows to find the parameter (0.30 "SP") (0.001 "M") and press "M" or "Enter" to enter the edit mode.
- Use the up and down arrows to select "Read".
- Press "M" or "Enter" to save the new value and exit the edit mode.
- Press the red button "Stop/Reset", the word "Read" becomes "None" and the parameters are saved in the smartcard.

For more explanation on the smartcard, go to the parameter "11.42" or "11.042" in the drive manual.

8.8. Over speed test 125%:

- Note the speed in RPM to reach the contract speed. That value has to be put in the parameters 0.02 and 0.26 for the "SP" drive and 0.019 and 0.026 for the "M" drive at the end of the test.
- Put the car in Maintenance mode and send the car to the top floor.
- Use the arrows to find the sub-menu "PRESET REFERENCE 7 (0.26 "SP") (0.026 "M")" which corresponds to the contract speed.
- Note of the speed in RPM to reach the contract speed. That value has to be put back to its original value at the end of the test.

  Example for an application of a 300FPM contract speed:

  300 FPM X 1.25 = 375 FPM (speed at which the governor will be activated)
  If 1175 RPM(motor) = 300 FPM(1175 RPM is the speed entered in parameter (0.26 "SP") (0.026 "M")")
  X RPM = 375 FPM
  So, 1175 X 375/300 = 1468 RPM + 20 RPM to activate the governor
- Press "M" or "Enter" and use the arrows to enter 1488 RPM. Press "M" or "Enter" to save.
- Use the up and down arrows to find the sub-menu "MAXIMUM REFERENCE CLAMP (0.02 "SP") (0.019 "M")".
- Note the parameter because it will have to be put back to its original at the end of the test.
- Press "M" or "Enter" and use the arrows to enter 127 RPM. Press "M" or "Enter" to save.

8.8.1. Parameters modification to reach 125% with elevator of more than 200FPM:

Elevators going faster than 200 FPM have an emergency stopping device at top and bottom floors. Another processor calculates the elevator's actual speed using the

perforated tape or the governor encoder. This processor has an over speed protection activating at 115% of the contract speed.

To be able to accelerate the elevator at 125%, change the parameter "D14" (contract speed) in the processor CP1L (example: 300 FPM X 1.27=381 FPM).

Do as followed with the LCD screen, (connect the LCD on the CP1L PLC):

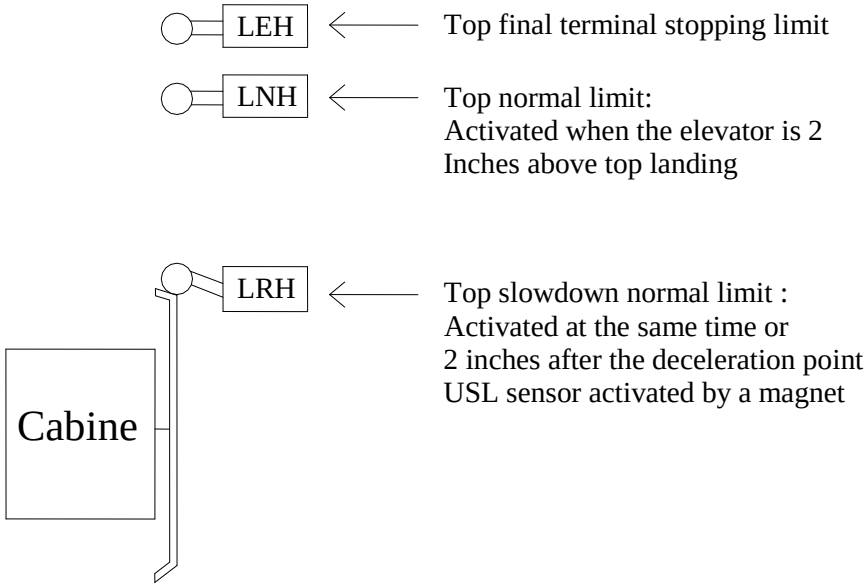
- Press "ESC" and the "UP/DOWN" keys to select "REGISTER ACCESS".
- Press "ENTER".
- Choose "DM" for register type.
- Press "ENTER".
- Press the "LEFT/RIGHT" and "UP/DOWN" keys to enter 0014.
- Press "ENTER"
- Press "ENTER" to modify the value, enter the new value (example:0381) and press "ENTER" to save the modification.
- Be prepared to note the real speed with the tachometer. Place a car call to the bottom floor.

Do not forget to put back the original values in the drive's parameters "MAXIMUM REFERENCE CLAMP (0.02 "SP") (0.019 "M")" and "PRESET REFERENCE 7 (0.26 "SP") (0.026 "M")" and to save in the drive. Also, for the elevators of 200 FPM and more, put back DM 14 in the CP1L processor, to its original value.

9. SLOWDOWN NORMAL LIMITS ADJUSTMENT AND EMERGENCY TERMINAL STOPPING DEVICE SYSTEM FOR TOP AND BOTTOM FLOORS:

9.1. NORMAL AND SLOWDOWN LIMIT SWITCHES INSTALLATION FOR ELEVATORS 200FPM OR LESS:

9.1.1. Elevator using magnets tape slector:

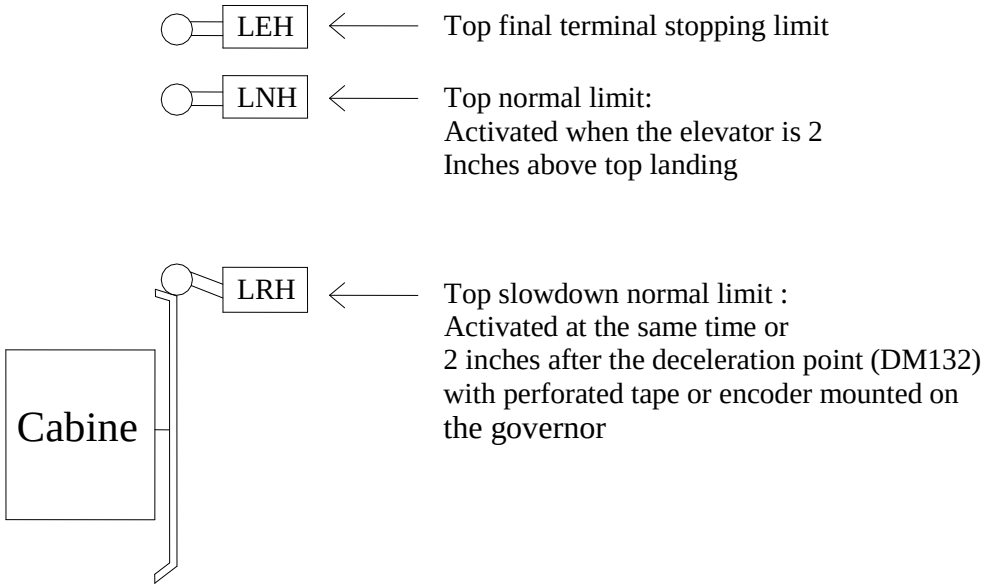


The schematic above represent the top landing. The same corresponding limit switches are found at the bottom floor: LRB, LNB and LEB. Down normal slowdown limit switch "LRB" must be activated at the same time or slightly after (max 2 inches of travel) the magnet activates the "DSL" sensor. The down normal limit switch "LNB" is activated as soon as the car goes slightly lower than the bottom floor.

Always ensure that the slowdowns are engaged by the magnets, and not by the slowdown limit switches "LRH" or "LRB".

Always make sure that normal stops at top and bottom floors are not done by the normal limits "LNH" or "LNB".

9.1.2. Elevator with perforated tape or encoder installed on the governor:



The schematic above represent the top landing. The same corresponding limit switches are found at the bottom floor: LRB, LNB and LEB. The elevator accel / decel must be adjusted before making the final adjustement of the slowdown normal limit. There are 2 ways to place slowdown limits: The first one is using a tape. The second one is using the LCD monitoring screen "P" position.

The "P" for position displays counts from the bottom landing.

Each count equals to 3/4 inch

LRH and LRB limits position:

1st way:

- To access register DM132 : « ELEVATOR & LCD SETTINGS → ELEVATOR OPTIONS → ENCODER/ BAR CODE / PERFOR. TAPE → DECEL DISTANCE SPD <= 225FPM ».
    - If the slowdown distance in DM132 is 82: 82 x 0,75in = 61½ in

Therefore, the limits should engage slightly closer to the final terminal landing that is, approximately 61 inches before the landing.

2nd way:

- To access register DM132: « ELEVATOR & LCD SETTINGS → ELEVATOR OPTIONS → ENCODER/ BAR CODE / PERFOR. TAPE → DECEL DISTANCE SPD <= 225FPM ».

  - LRH adjustment: Place the car to the top terminal landing equal to the floor (DZO activated, LU and LD deactivated). Write down the number of counts displayed in the lcd screen "P" (ex. 500 counts). Subtract the value in DM132 (ex: 82 counts) Add one count to the result and this will give the position of the normal slowdown limit "LRH".

  Example:

  P = 500 counts

  Slowdown distance in DM132 = 82 counts
  500-82 =418 countss
  418+1count = 419 counts, position of the slowdown limit "LRH"

  - LRB adjustment: Place the car at the bottom floor equal to the floor (DZO activated, LU, and LD deactivated). Write down the number of counts displayed in the lcd screen "P" (ex. 10 counts). To this value, you must add DM132 and after, subtract 1. The result will give the position of the slowdown limits "LRB"

  Example:

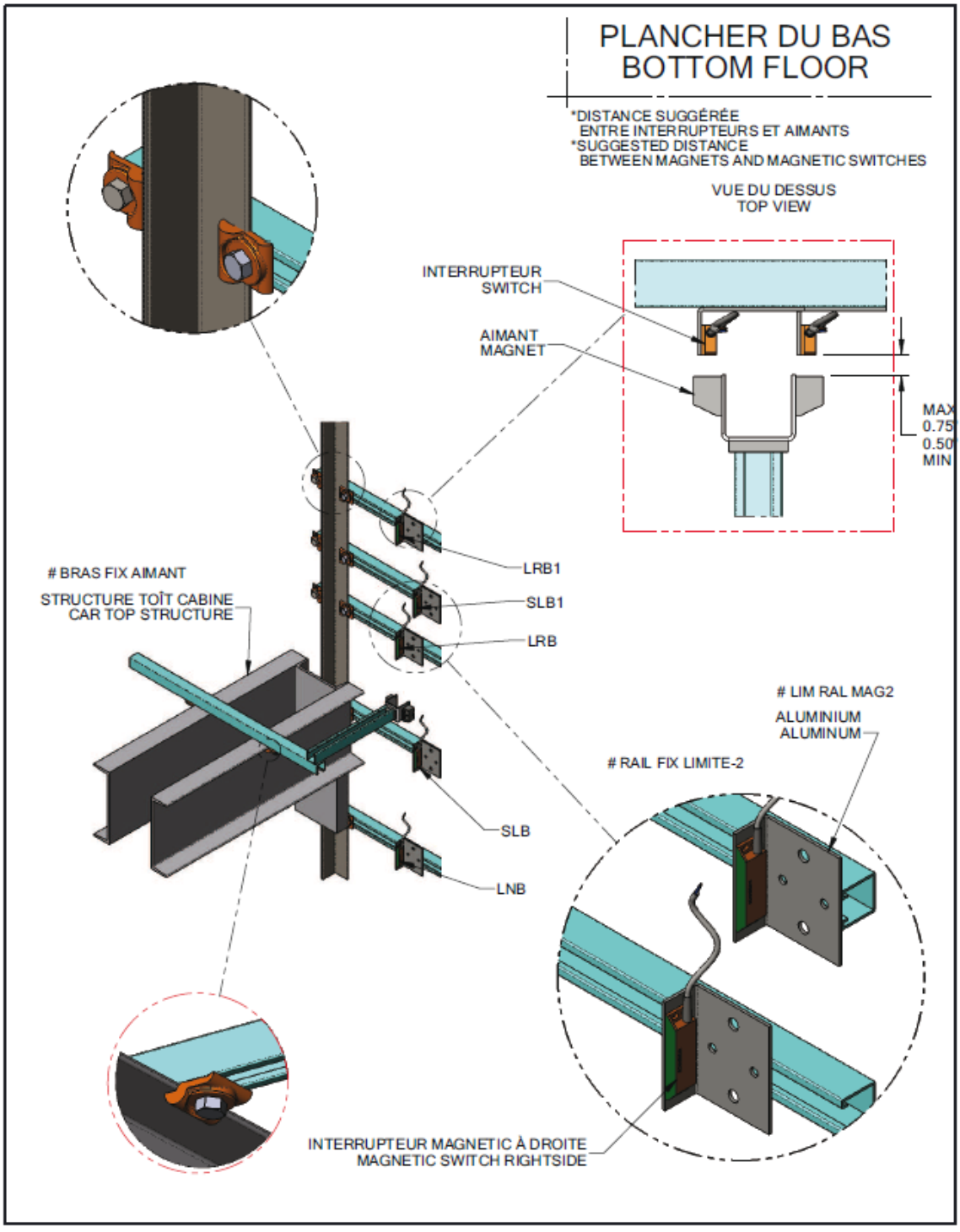
  10 counts
  Slowdown distance in DM132 = 82 counts
  10+82 =92 counts
  92-1count = 91 counts, position of the slowdown limit "LRB"

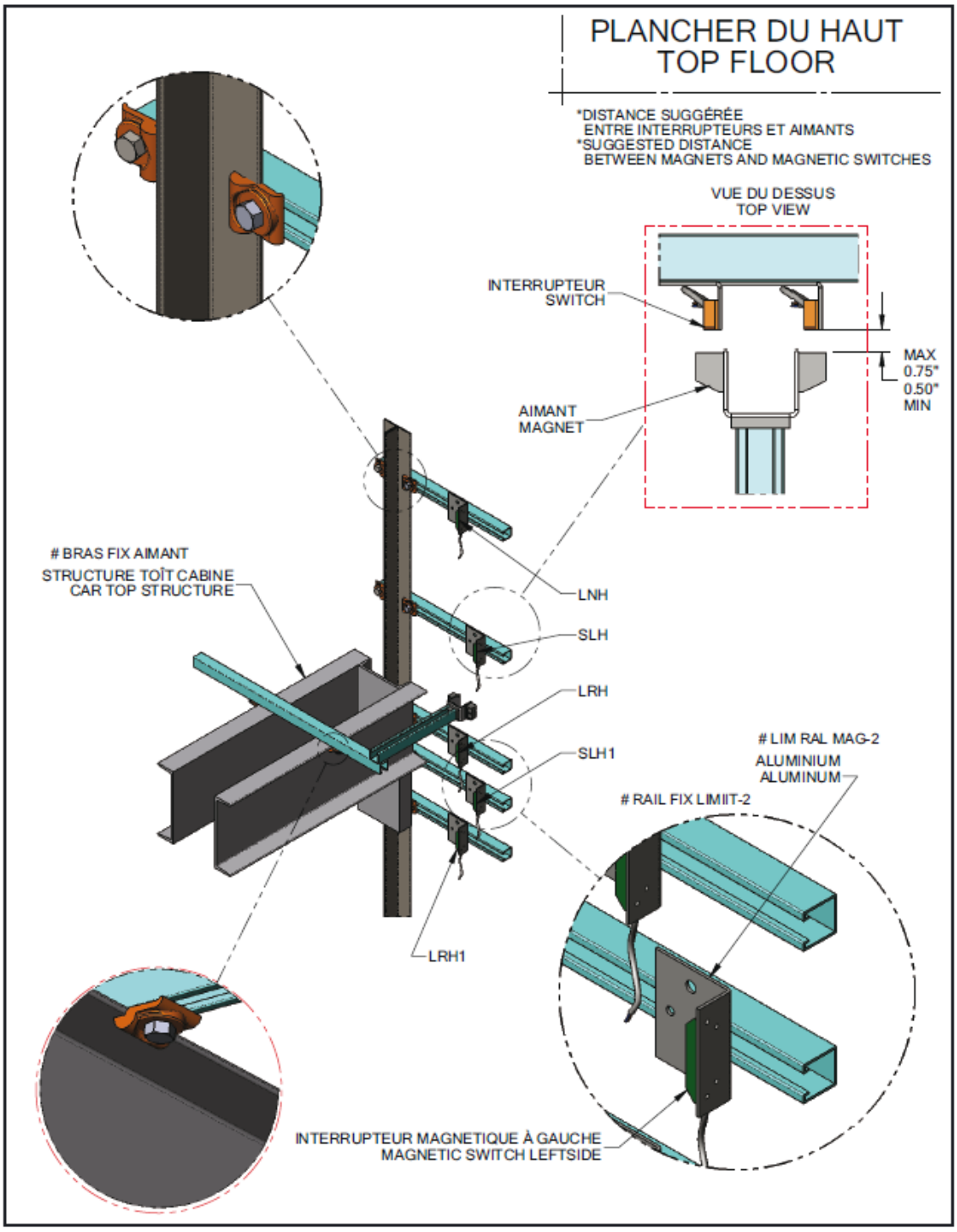
9.1.3. Schmersal magnetic switch installation supplied by Automatisation JRT Inc.

SLH/SLB :	For elevators 200 FPM or less, there is no need to install an emergency terminal stopping device.
LRH/LRB :	Normal slowdown limit at top and bottom landing.
LRH1/LRB1:	For elevators 200 FPM or less, there is no need to install high speed normal slowdown limit.

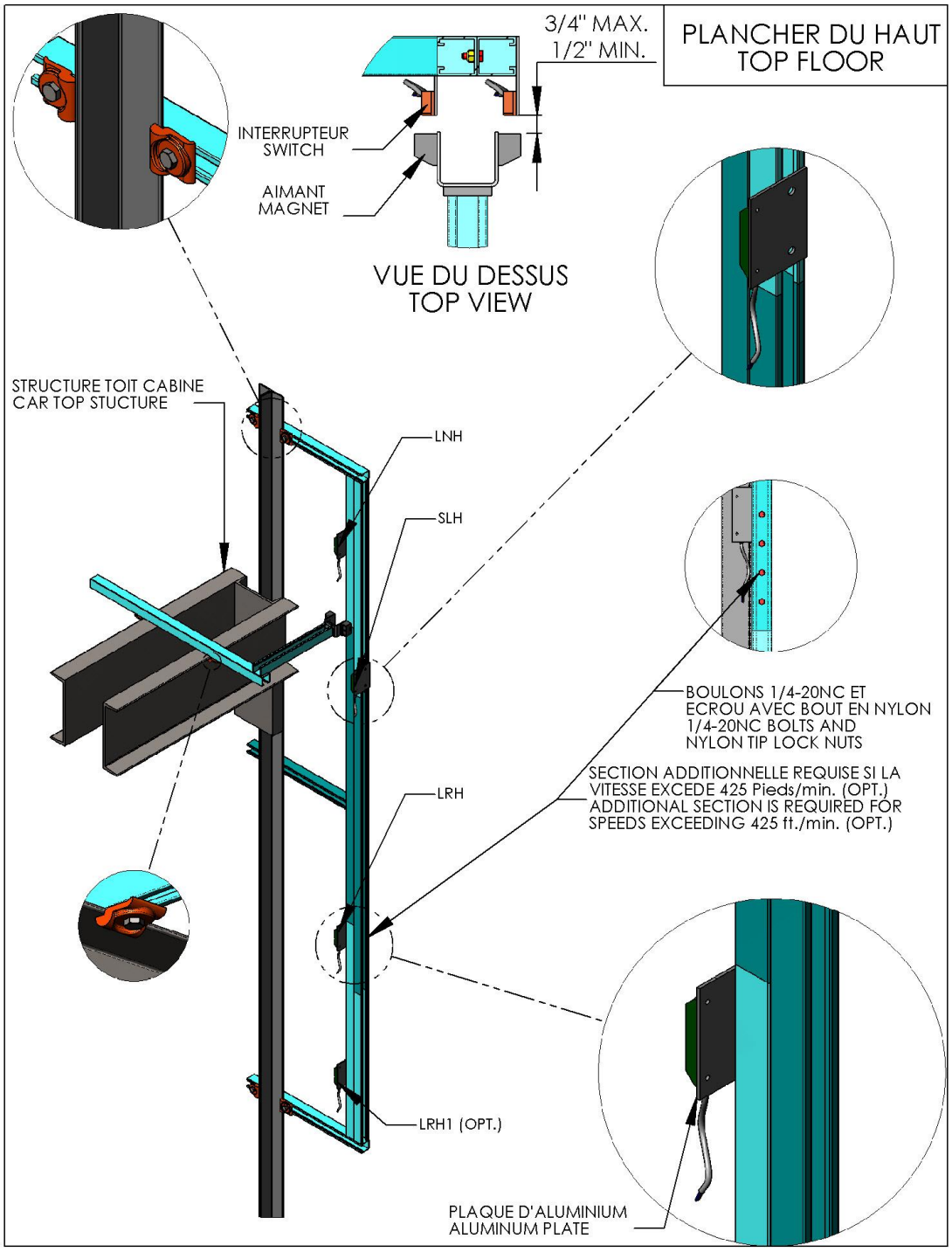
Installation of Schmersal magnetics switches supplied by Automatisation JRT Inc.:

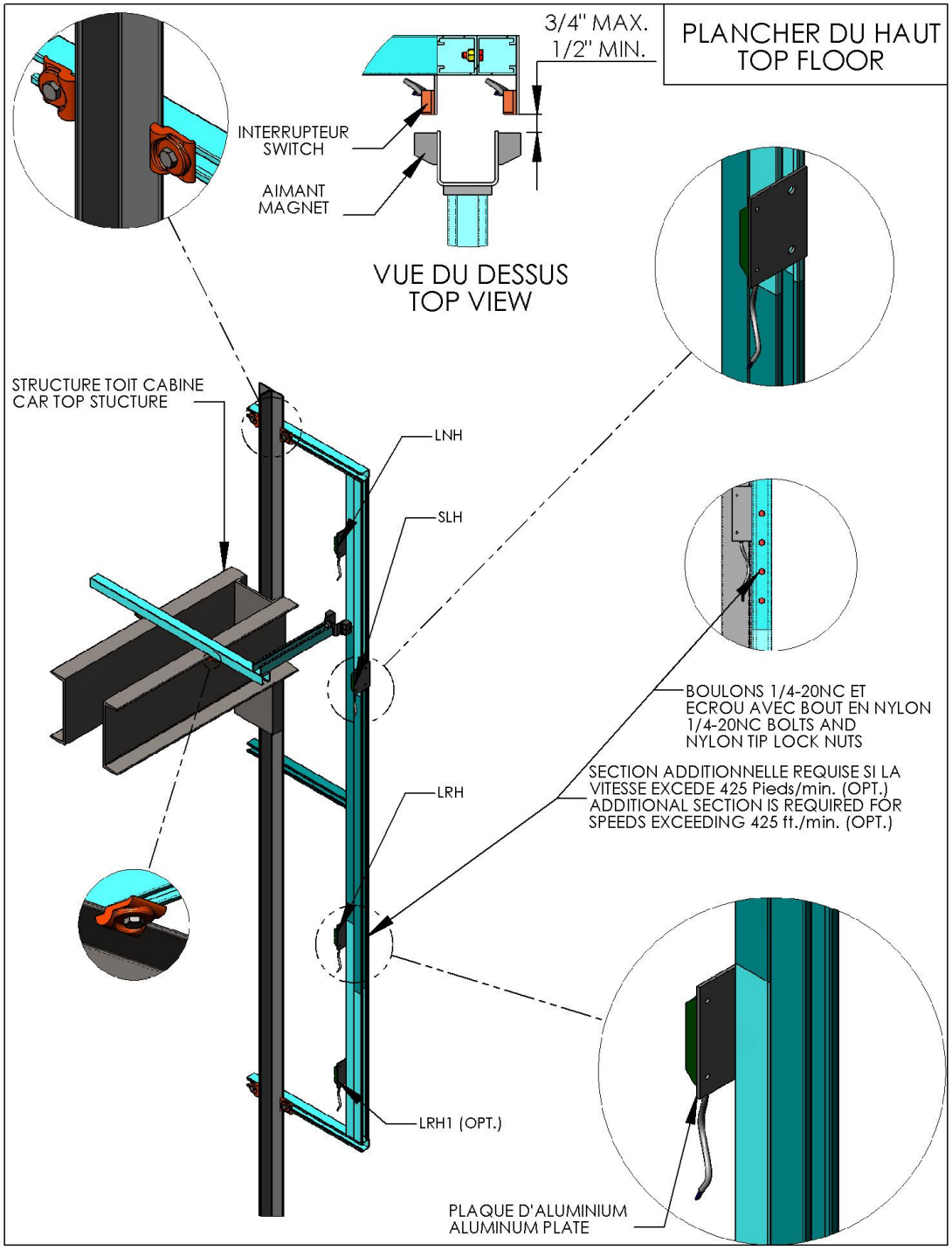
NEW MODEL




PLANCHER DU HAUT
TOP FLOOR
*DISTANCE SUGGÉRÉE
ENTRE INTERRUPTEURS ET AIMANTS
*SUGGESTED DISTANCE
BETWEEN MAGNETS AND MAGNETIC SWITCHES
VUE DU DESSUS
TOP VIEW
INTERRUPTEUR
SWITCH
AIMANT
MAGNET
MAX
0.75"
0.50"
MIN
BRAS FIX AIMANT
STRUCTURE TOÎT CABINE
CAR TOP STRUCTURE
LNH
SLH
LRH
SLH1
LRH1
LIM RAL MAG-2
ALUMINIUM
ALUMINUM
RAIL FIX LIMIT-2
INTERRUPTEUR MAGNETIQUE À GAUCHE
MAGNETIC SWITCH LEFTSIDE

OLD MODEL


3/4" MAX.
1/2" MIN.
PLANCHER DU HAUT
TOP FLOOR
INTERRUPTEUR
SWITCH
AIMANT
MAGNET
VUE DU DESSUS
TOP VIEW
STRUCTURE TOIT CABINE
CAR TOP STUCTURE
LNH
SLH
LRH
LRH1 (OPT.)
BOULONS 1/4-20NC ET
ECROU AVEC BOUT EN NYLON
1/4-20NC BOLTS AND
NYLON TIP LOCK NUTS
SECTION ADDITIONNELLE REQUISE SI LA
VITESSE EXCEDE 425 Pieds/min. (OPT.)
ADDITIONAL SECTION IS REQUIRED FOR
SPEEDS EXCEEDING 425 ft./min. (OPT.)
PLAQUE D'ALUMINIUM
ALUMINUM PLATE



SLH: Top floor stopping device.
LRH: Top floor normal slowdown limit (one floor run for speed of 300 FPM and more).
LRH1: Top floor normal slowdown high speed travel.

9.1.4. Normal slowdown limit position correction for perforated tape or governor encoder:

The main processor verifies continuously the normal slowdown limits position at bottom and top landing.

Slowdown limits	***Corresponding DM***
LRB	DM360
LRH	DM364
LRB1	DM362
LRH1	DM366

The processor computes the difference between the elevator deceleration point and the physical position where the switch opens upon arriving at a terminal landing. If the register contains 3, that means the limits opens 3 counts after the elevator deceleration point. The value contains in register DM 359 is the error detection level that will generate a warning in the fault history alarm buffer. The error detection level can be changed and between 4 and 48 counts. These are the 4 possible warnings:

Warning	***Description***	***Corresponding DM***
HR83.14	Bad ajustment LRB	DM360
HR83.15	Bad ajustment LRH	DM364
HR84.00	Bad ajustment LRB1	DM362
HR84.05	Bad ajustment LRH1	DM366

A value « 0000 » in one of those registers indicates that the slowdown limit opens before or at the elevator deceleration point. It is always better the switch opens slightly after the elevator deceleration point to obtain the same leveling speed distance at every floor. A value beteen 1 and 3 is a good slowdown limit adjustment. Each count equals to 3/4 inch.

Example with LRB:

To visualize the DM360:

- Press "ESC" and on the "UP/DOWN" keys to select "REGISTER ACCESS".
- Press "ENTER".
- Choose "DM" for the type of register.
- Press "ENTER".
- Press the "LEFT/RIGHT" and "UP/DOWN" keys to enter 0360.
- Press "ENTER".

10 counts (difference between the deceleration point and the limit)
*10 counts *0.75=7.5 inches*
The normal slowdown limit LRB needs to be move up about 7 inches.

The number of counts should be between 1 and 3.

If counts for the deceleration point are changed in registers (DM132 or DM133), the normal slowdown limits will have to be moved.

9.1.5. "UCM" aditional processor for contract speed elevators 150 FPM or less:

Elevators with a contract speed of 150 FPM or less needs an additional processor "UCM" that will detect unintended car movement. If the elevator leaves the landing zone without commande, the emergency brake will apply immediately.

The main processor detects in all mode of operation the UCM condition. The UCM processor is a second device that uses leveling sensors and door zone sensors as a redundant mean to detect UCM condition. The main processor continuously reads signal from the UCM processor to disgnostic operation problems of that device.

Be carefull if you disconnect the tape selector supply in the door zone and LU or LD sensors are activated, that will generate that fault.

See section 13.1.5 for fault list.

9.1.6. "UCM" processor faults for contract speed elevators 150 FPM or less:

Fault codes indicator using "UCM" processor outputs :

When a fault is detected by the processor, outputs 04, and 05 of the "UCM" processor will blink. The table bellow list fault codes.

Blinking fault codes	**Binary code**	
Faults	**Output 04**	**Output 05**
UCM relay deactivated. (unintended car movement detected)	ON	OFF
Processor memory battery as to be replaced.	OFF	ON
No fault	OFF	OFF

9.1.7. "NTSD" aditional processor for contract speed elevators 200 FPM:

Elevators with a contract speed of 200 FPM needs an additional processor "NTSD" and different position feedback than the normal mean as mentioned by the elevator code. This processor allows:

- Slowdown the elevator at terminal landings in case of failure of the normal slowdown position system. The (NTSD) processor operates with « LRH » and « LRB » mechanical or magnetic switches. As soon one of those switch opens at a terminal landing, the slowdown command will be forced to the variable speed drive using relay « NTSD ».

- Detect unintended car movement of the elevator. As soon as the « NTSD » processor detects an unintended car movement, the emergency brake will apply. « UCM » relay will be deactivated.

- Detect if the elevator speed exceeds 150 FPM in inspection. As soon the elevator speed exceeds 150FPM, the emergency brake will apply. « UCM » relay will be deactivated.

9.1.8. "NTSD" processor faults for contract speed elevators 200 FPM:

When a fault is detected by the (NTSD) processor, the fault will be saved in the processor memory, here are two ways to view alarms :

See section 13.1.5 for fault list.

9.1.8.1. Fault codes indicator using "NTSD" processor outputs:

When a fault is detected by the processor, outputs 03, 04, and 05 of the "NTSD" processor will blink. The table bellow list fault codes:

Blinking fault codes				**Binary code**
Faults	**Output 03**	**Output 04**	**Output 05**	
NTSD independent positionning feedback signal lost.	ON	ON	ON	7
UCM relay deactivated. (unintended car movement detected)	ON	ON	OFF	6
Elevator speed exceeds 150 FPM in inspection.	ON	OFF	ON	5
Processor memory battery as to be replaced.	ON	OFF	OFF	4
UDCR relay contact stuck.	OFF	ON	ON	3
N/A	OFF	ON	OFF	2
LRH/LRB activated at the same time.	OFF	OFF	ON	1
No fault	OFF	OFF	OFF	0

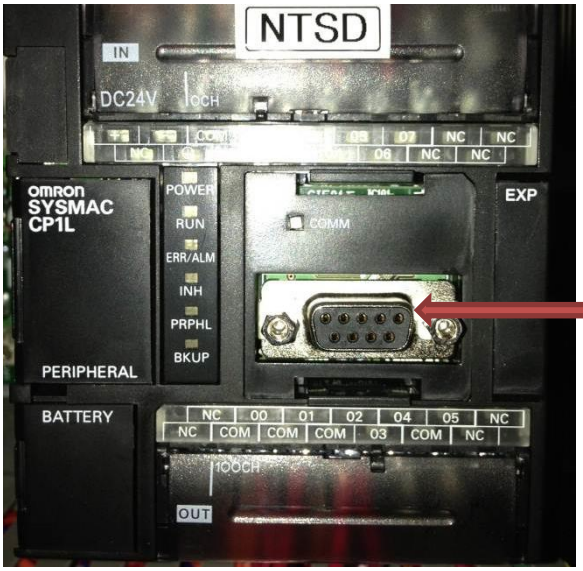
9.1.8.2. Using the LCD in the controller to access “NTSD” processor fault codes:

To access “NTSD” processor fault codes, the LCD in the controller can be used. Follow those steps:

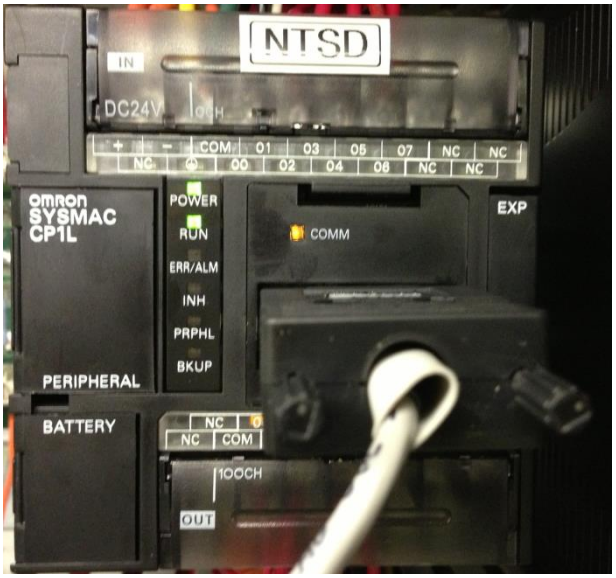
- Disconnect the LCD communication cable from the main processor CJ1M (port 232) or from the CS1W-CN118 adaptor when the LCD is connected on the peripheral port (refer to the electrical schematic).

Disconnect the LCD cable from main processor CJ1M.

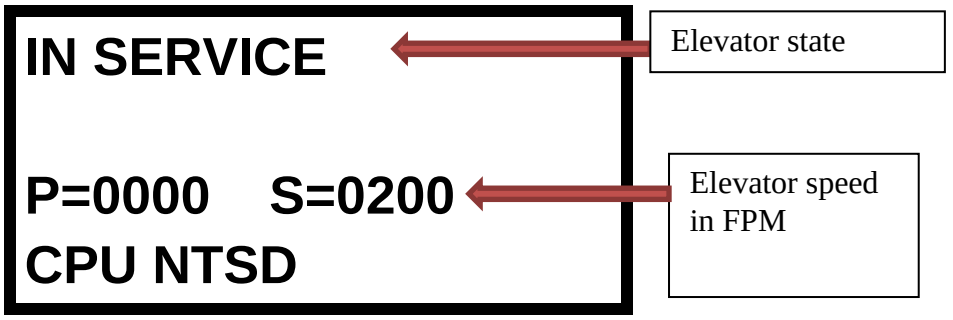
- Connect the LCD cable to the « NTSD » CPU.



Connect the LCD cable to the NTSD communication port.



- When the LCD will detect the NTSD processor, the following screen will be displayed:



- Press « ESC » key.
- Press « UP/DOWN » key up to the menu « ALARMS & CPU I/O CHECKING ».
- Press « ENTER » key.
- Press « UP/DOWN » key up to the menu « ACTIVE FAULTS LIST ».
- Press « ENTER » key..

  To erase faults:

- Press « ENTER » key. Another message will be displayed to confirm faults erasing.

See section 13.1.5 for fault list.

9.1.9. “NTSD” processor with independent position feedbacks:

Elevators with contract speed of 200 FPM must have a second position feedback independent from the main processor position feedback as required by the elevator code. The main processor position feedback can be from the perforated tape reader (HT1 / HT2 signals) or from an encoder mounted on the governor shaft (HT1 / HT2 signals). The second independent position feedback can be from one of those two systems:

- Two proximity sensors installed above the perforated tape sensor head (« HT1B » and « HT2B » signals). To verify the good operation of that second feedback, observe the elevator speed displayed when the LCD is connected on the « NTSD » processor as explained in section 9.1.8.2.

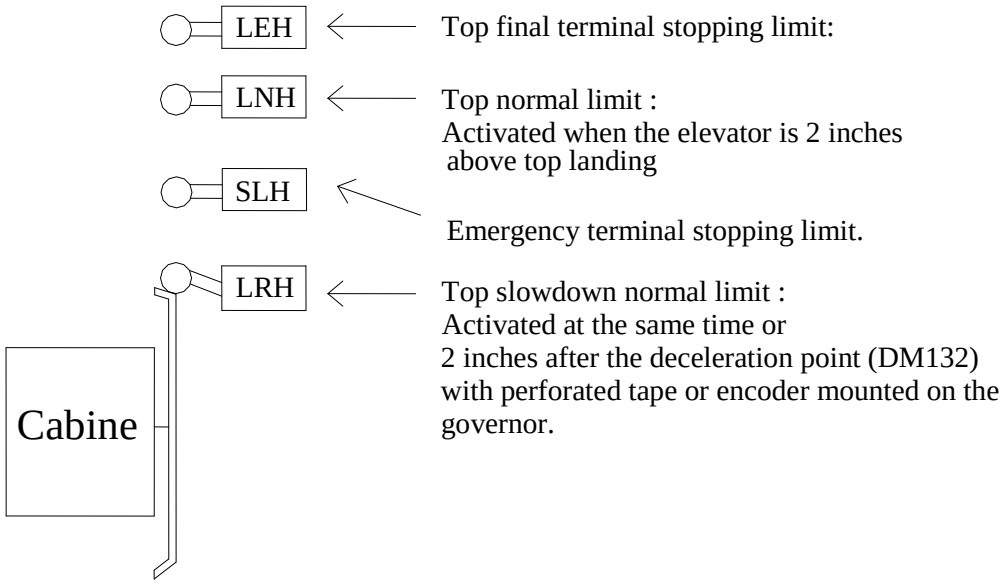
- Two encoders mounted back to back on the governor shaft or an encoder with dual independent channels (« HT1B » and « HT2B » signals). To verify the good operation of that second feedback, observe the elevator speed displayed when the LCD is connected on the « NTSD » processor as explained in section 9.1.8.2.

- The perforated tape reader can also be used (« HT1B » and « HT2B » signals). To verify the good operation of that second feedback, observe the elevator speed displayed when the LCD is connected on the « NTSD » processor as explained in section 9.1.8.2.

WARNING : For all types of independent position feddbacks,if the position counter increases when the elevator is going down, you must reverse « HT1B » and « HT2B » signals. Counts must increase when elevator is moving up.

9.2. NORMAL AND SLOWDOWN LIMIT SWITCHES INSTALLATION FOR ELEVATORS WITH CONTRACT SPEED HIGHER THAN 200FPM:

9.2.1. Elevator contract speed from 201 fpm to 250 fpm:


LEH
Top final terminal stopping limit:
LNH
Top normal limit :
Activated when the elevator is 2 inches above top landing
SLH
Emergency terminal stopping limit.
LRH
Top slowdown normal limit :
Activated at the same time or
2 inches after the deceleration point (DM132)
with perforated tape or encoder mounted on the governor.
Cabine

The schematic above represent the top landing. The same corresponding limit switches are found at the bottom floor: LRB, SLB, LNB and LEB. The elevator accel / decel must be adjusted before making the final adjustement of the slowdown normal limit. There are 2 ways to place slowdown limits: The first one is using a tape. The second one is using the LCD monitoring screen "P" position.

The "P" position is displayed in counts.

Each count equals to 3/4 inch

<u>LRH and LRB limits position:</u>

1st way:

- To access register DM132 : « ELEVATOR & LCD SETTINGS → ELEVATOR OPTIONS → ENCODER/ BAR CODE / PERFOR. TAPE → DECEL DISTANCE SPD <= 225FPM ».

  - If the slowdown distance in DM132 is 82: 82 x 0,75in = 61½ in

  Therefore, the limits should engage slightly closer to the final terminal landing that is, approximately 61 inches before the landing.

2nd way:

- To access register DM132 : « ELEVATOR & LCD SETTINGS → ELEVATOR OPTIONS → ENCODER/ BAR CODE / PERFOR. TAPE → DECEL DISTANCE SPD <= 225FPM ».

  - LRH adjustment: Place the car to the top terminal landing equal to the floor (DZO activated, LU and LD deactivated). Write down the number of counts displayed in the LCD screen "P" (ex. 500 counts). Subtract the value in DM132 (ex: 82 counts). Add one count to the result and this will give the position of the normal slowdown limit "LRH".

  Example:

  P = 500 counts

  Slowdown distance in DM132 = 82 counts
  500-82 =418 counts
  418+1count = 419 counts, position of the slowdown limit "LRH"

  - LRB adjustment: Place the car at the bottom floor equal to the floor (DZO activated, LU, and LD deactivated). Write down the number of counts displayed in the LCD screen "P" (ex. 10 counts). To this value, you must add DM132 and after, subtract 1. The result will give the position of the slowdown limits "LRB".

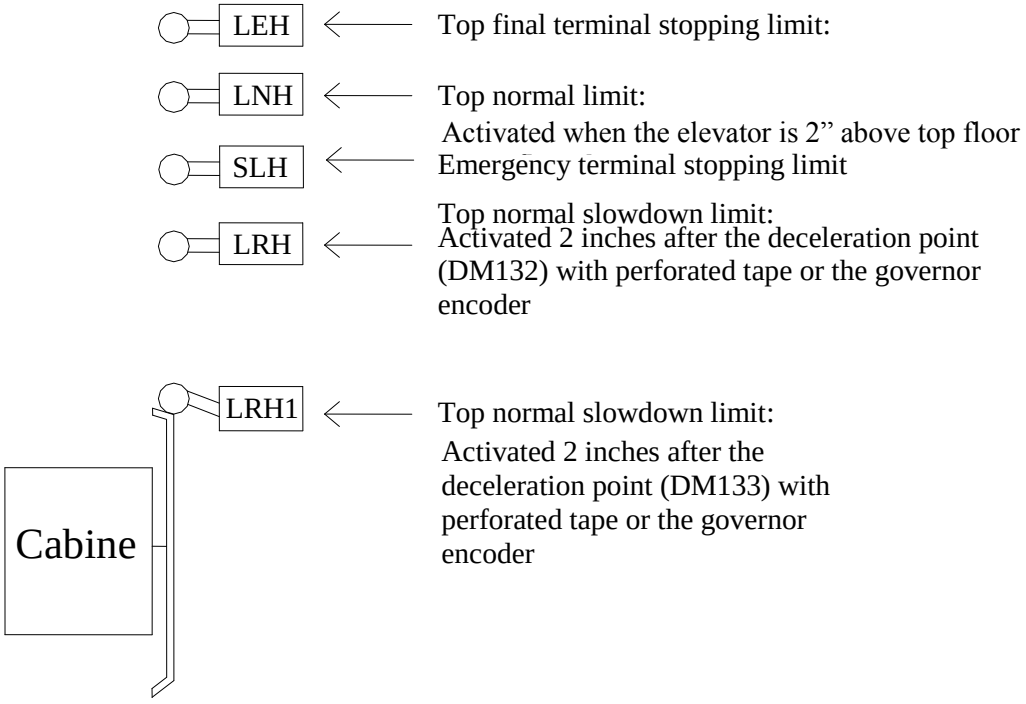
  Example:

  10 counts
  Slowdown distance in DM132 = 82 counts
  10+82 =92 counts
  92-1count = 91 counts, position of the slowdown limit "LRB"

SLH and SLB limits position:

- Installed SLB and SLH limits at 24 inches from the floor approximatively. Install SLB at 24 inches from bottom landing. Install SLH at 24 inches from top landing.

9.2.2. Elevator contract speed from 251 FPM to 400 FPM


LEH
Top final terminal stopping limit:
LNH
Top normal limit:
Activated when the elevator is 2" above top floor
SLH
Emergency terminal stopping limit
Top normal slowdown limit:
LRH
Activated 2 inches after the deceleration point (DM132) with perforated tape or the governor encoder
LRH1
Top normal slowdown limit:
Activated 2 inches after the deceleration point (DM133) with perforated tape or the governor encoder
Cabine

The schematic above represent the top landing. The same corresponding limit switches are found at the bottom floor: LRB1, LRB, SLB, LNB and LEB. The elevator accel / decel must be adjusted before making the final adjustement of the slowdown normal limit. There are 2 ways to place slowdown limits: The first one is using a tape. The second one is using the LCD monitoring screen "P" position.

The "P" position is displayed in counts.

Each count equals to 3/4 inch

- LRH1-LRB1 = First slowdown (high speed, contract speed).
- LRH-LRB = Second slowdown (one floor run).

LRH1 and LRB1 limits position:

1st way:

- To access register DM133 : « ELEVATOR & LCD SETTINGS → ELEVATOR OPTIONS → ENCODER/ BAR CODE / PERFOR. TAPE → DECEL DISTANCE SPD >= 250FPM ».

  - If the slowdown distance for high speed runs DM133 is 120: 120 x 0,75in = 90 inches.

  Therefore, the limits should engage slightly closer to the final terminal landing that is, approximately 89 inches before the landing.

2nd way:

- To access register DM133 : « ELEVATOR & LCD SETTINGS → ELEVATOR OPTIONS → ENCODER/ BAR CODE / PERFOR. TAPE → DECEL DISTANCE SPD >= 250FPM ».

- LRH1 adjustment: Place the car to the top terminal landing equal to the floor (DZO activated, LU and LD deactivated). Write down the number of counts displayed in the LCD screen "P" (ex. 500 counts). Subtract the value in DM133 (ex: 120 counts) Add one count to the result and this will give the position of the normal slowdown limit "LRH1".

  Example:

  P = 500 counts

  Slowdown distance in DM133 = 120 counts
  500-120 = counts
  380 + 1count = 381 counts, position of the slowdown limit "LRH1"

  - LRB1 adjustment: Place the car at the bottom floor equal to the floor (DZO activated, LU, and LD deactivated). Write down the number of counts displayed in the LCD screen "P" (ex. 10 counts). To this value, you must add DM133 and after, subtract 1. The result will give the position of the slowdown limits "LRB1"

  Example:

  10 counts
  Slowdown distance in DM133 = 120 counts
  10+120 =130 counts
  130 - 1count = 129 counts, position of the slowdown limit "LRB1"

LRH and LRB limits position:

1st way:

- To access register DM132 : « ELEVATOR & LCD SETTINGS → ELEVATOR OPTIONS → ENCODER/ BAR CODE / PERFOR. TAPE → DECEL DISTANCE SPD <= 225FPM ».

- If the slowdown distance in DM132 is 82: 82 x 0,75in = 61½ in

  Therefore, the limits should engage slightly closer to the final terminal landing that is, approximately 61 inches before the landing.

2nd way:

- To access register DM132 : « ELEVATOR & LCD SETTINGS → ELEVATOR OPTIONS → ENCODER/ BAR CODE / PERFOR. TAPE → DECEL DISTANCE SPD <= 225FPM ».

- LRH adjustment: Place the car to the top terminal landing equal to the floor (DZO activated, LU and LD deactivated). Write down the number of counts displayed in the LCD screen "P" (ex. 500 counts). Subtract the value in DM132 (ex: 82 counts) Add one count to the result and this will give the position of the normal slowdown limit "LRH".

  Example:

  P = 500 counts

  Slowdown distance in DM132 = 82 counts
  500-82 =418 counts
  418+1count = 419 counts, position of the slowdown limit "LRH"

- LRB adjustment: Place the car at the bottom floor equal to the floor (DZO activated, LU, and LD deactivated). Write down the number of counts displayed in the LCD screen "P" (ex. 10 counts). To this value, you must add DM132 and after, subtract 1. The result will give the position of the slowdown limits "LRB".

  Example:

  10 counts
  Slowdown distance in DM132 = 82 counts
  10+82 =92 counts
  92-1count = 91 counts, position of the slowdown limit "LRB".

Always make sure that slowdowns are initiated by the perforated tape or the governor encoder rather than by the slowdown limits. The deceleration should never be engaged by the NTSD processor in normal operation.

If the slowdown counts number is changed, the slowdown limit will have to be moved.

SLH and SLB limits position:

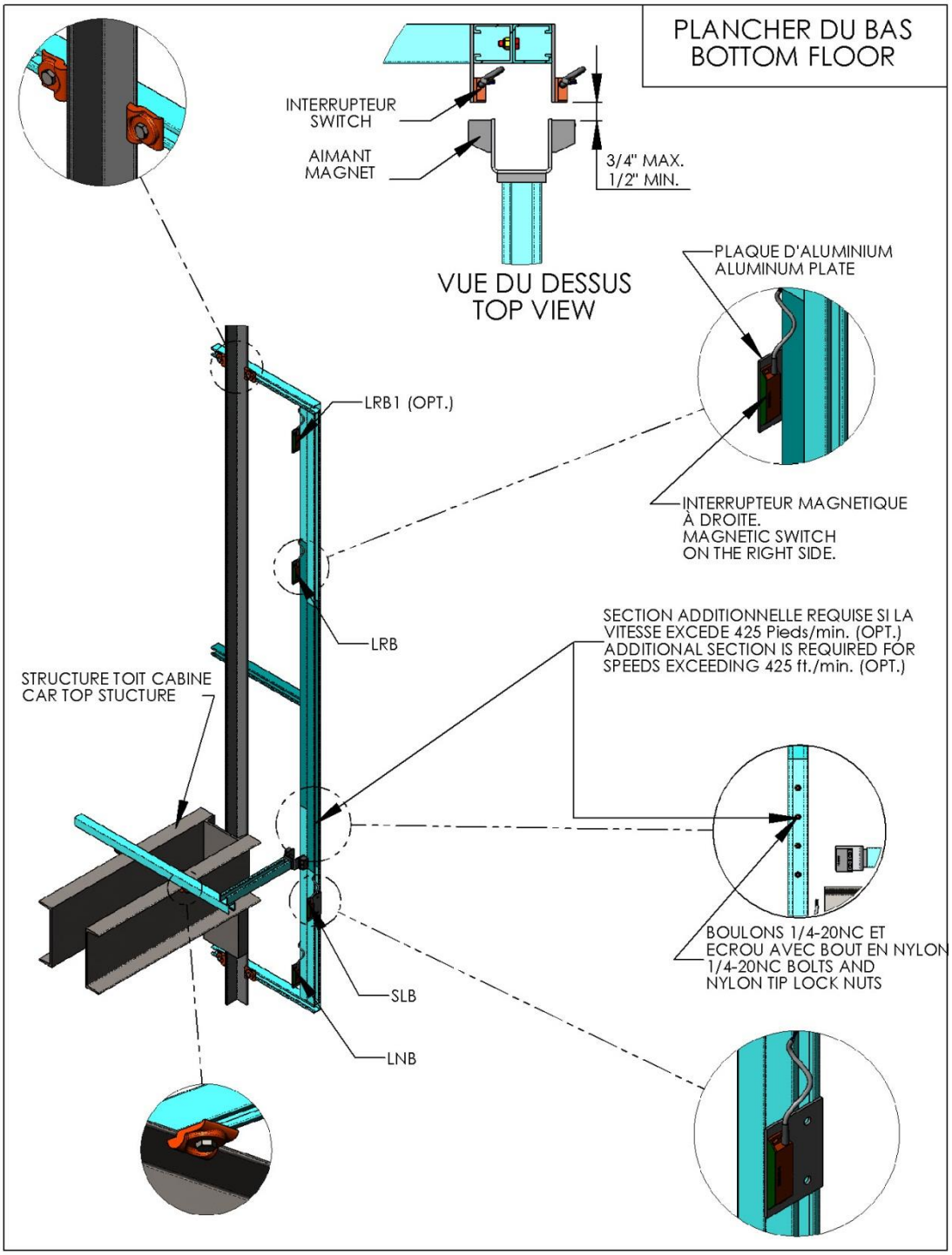
Installed SLB and SLH limits at 24 inches from the floor approximatively. Install SLB at 24 inches from bottom landing. Install SLH at 24 inches from top landing.

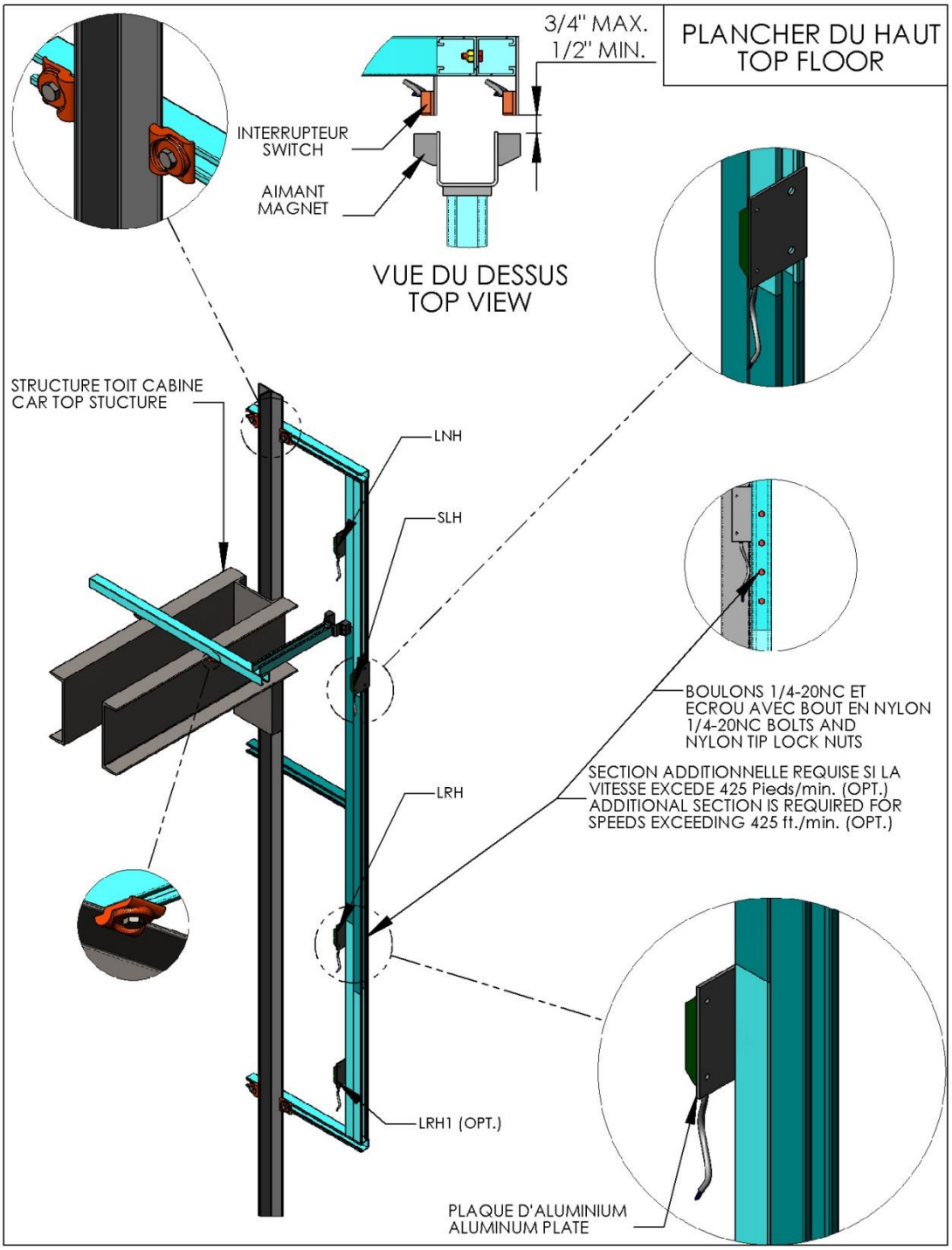
9.2.3. Schmersal magnetic switch installation supplied by Automatisation JRT Inc.

SLH/SLB : Emergency terminal stopping device switches.

LRH/LRB : Normal slowdown limit at top and bottom landing.

LRH1/LRB1: High speed normal slowdown limit.


PLANCHER DU BAS
BOTTOM FLOOR
INTERRUPTEUR
SWITCH
AIMANT
MAGNET
3/4" MAX.
1/2" MIN.
VUE DU DESSUS
TOP VIEW
PLAQUE D'ALUMINIUM
ALUMINUM PLATE
LRB1 (OPT.)
INTERRUPTEUR MAGNETIQUE
À DROITE.
MAGNETIC SWITCH
ON THE RIGHT SIDE.
LRB
SECTION ADDITIONNELLE REQUISE SI LA
VITESSE EXCEDE 425 Pieds/min. (OPT.)
ADDITIONAL SECTION IS REQUIRED FOR
SPEEDS EXCEEDING 425 ft./min. (OPT.)
STRUCTURE TOIT CABINE
CAR TOP STUCTURE
BOULONS 1/4-20NC ET
ECROU AVEC BOUT EN NYLON
1/4-20NC BOLTS AND
NYLON TIP LOCK NUTS
SLB
LNB


3/4" MAX.
1/2" MIN.
PLANCHER DU HAUT
TOP FLOOR
INTERRUPTEUR
SWITCH
AIMANT
MAGNET
VUE DU DESSUS
TOP VIEW
STRUCTURE TOIT CABINE
CAR TOP STUCTURE
LNH
SLH
LRH
LRH1 (OPT.)
BOULONS 1/4-20NC ET
ECROU AVEC BOUT EN NYLON
1/4-20NC BOLTS AND
NYLON TIP LOCK NUTS
SECTION ADDITIONNELLE REQUISE SI LA
VITESSE EXCEDE 425 Pieds/min. (OPT.)
ADDITIONAL SECTION IS REQUIRED FOR
SPEEDS EXCEEDING 425 ft./min. (OPT.)
PLAQUE D'ALUMINIUM
ALUMINUM PLATE

9.2.4. Normal slowdown limit position correction for perforated tape or governor encoder:

The main processor verifies continuously the normal slowdown limit position at bottom and top landing.

Slowdown limits	***Corresponding DM***
LRB	DM360
LRH	DM364
LRB1	DM362
LRH1	DM366

The processor computes the difference between the elevator deceleration point and the physical position where the switch opens upon arriving at a terminal landing. If the register contains 3, that means the limits opens 3 counts after the elevator deceleration point. The value contains in register DM 359 is the error detection level that will generate a warning in the fault history alarm buffer. The error detection level can be changed and between 4 and 48 counts. These are the 4 possible warnings:

Warning	***Description***	***Corresponding DM***
HR83.14	Bad ajustment LRB	DM360
HR83.15	Bad ajustment LRH	DM364
HR84.00	Bad ajustment LRB1	DM362
HR84.05	Bad ajustment LRH1	DM366

A value « 0000 » in one of those registers indicates that the slowdown limit opens before or at the elevator deceleration point. It is always better the switch opens slightly after the elevator deceleration point to obtain the same leveling speed distance at every floor. A value beteen 1 and 3 is a good slowdown limit adjustment. Each count equals to 3/4 inch.

Example with LRB:

To visualize the DM360:

- Press "ESC" and on the "UP/DOWN" keys to select "REGISTER ACCESS".
- Press "ENTER".
- Choose "DM" for the type of register.
- Press "ENTER".
- Press the "LEFT/RIGHT" and "UP/DOWN" keys to enter 0360.
- Press "ENTER".

10 counts (difference between the deceleration point and the limit)
*10 counts *0.75=7.5 inches*
The normal slowdown limit LRB needs to be move up about 7 inches.

The number of counts should be between 1 and 3.

If counts for the deceleration point are changed in registers (DM132 or DM133), the normal slowdown limits will have to be moved.

9.2.5. "NTSD" aditional processor for contract speed elevators greater than 200 FPM:

Elevators with a contract speed greater than 200 FPM needs an additional processor "NTSD" and different position feedback than the normal mean as mentioned by the elevator code. This processor can slow down the elevator in case of failure of the normal mean. The (NTSD) processor operates with « LRH1 », « LRH », « LRB1 » and « LRB » mechanical or magnetic switches. As soon one of those switch opens at a terminal landing, the slowdown command will be forced to the variable speed drive using relay « NTSD ».

9.2.6. "NTSD" processor faults for contract speed elevators greater than 200 FPM:

When a fault is detected by the (NTSD) processor, the fault will be saved in the processor memory, here are two ways to view alarms:

See section 13.1.5 for fault list.

9.2.6.1. Fault codes indicator using "NTSD" processor outputs:

When a fault is detected by the processor, outputs 03, 04, and 05 of the "NTSD" processor will blink. The table bellow list fault codes:

Blinking fault codes				**Binary code**
Faults	**Output 03**	**Output 04**	**Output 05**	
NTSD independent positionning feedback signal lost.	ON	OFF	ON	5
Processor memory battery as to be replaced.	ON	OFF	OFF	4
HSD signal from motor drive activated when elevator stopped.	OFF	ON	ON	3
LRH1/LRB1 activated at the same time.	OFF	ON	OFF	2
LRH/LRB activated at the same time.	OFF	OFF	ON	1

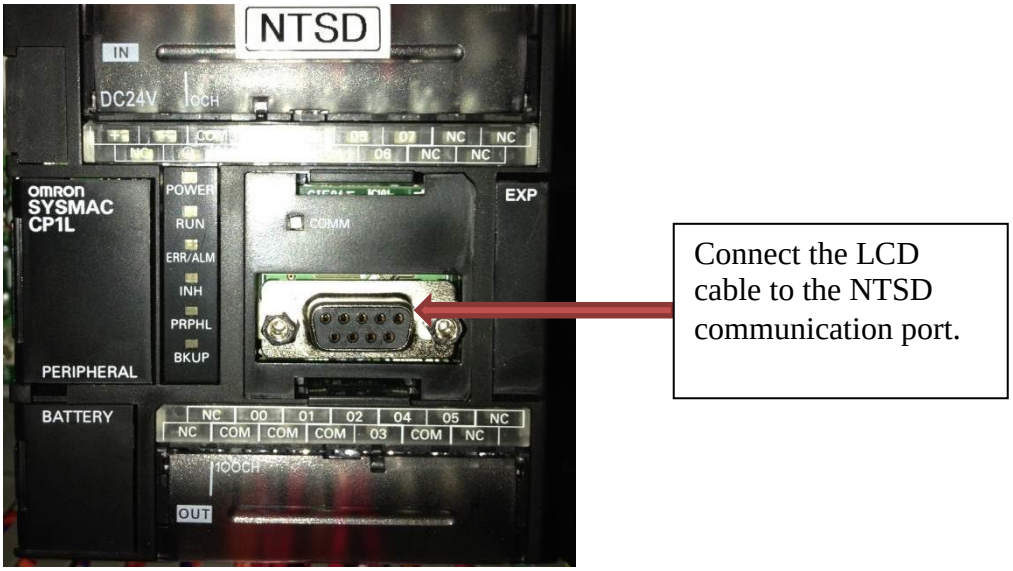
No fault	OFF	OFF	OFF	0

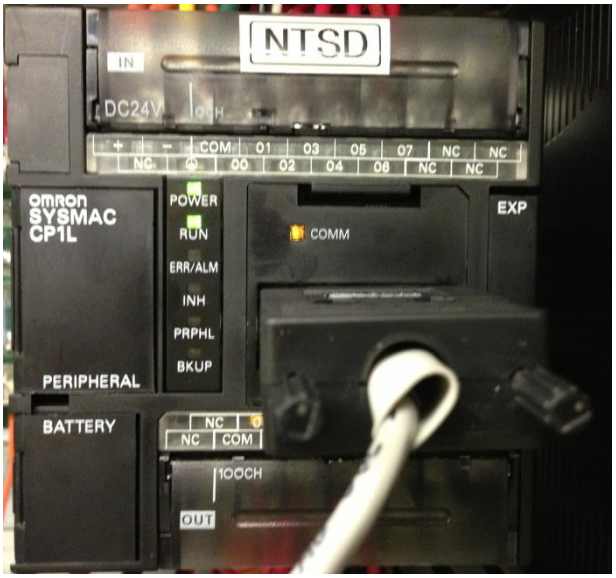
9.2.6.2. Using the LCD in the controller to access “NTSD” processor fault codes:

To access “NTSD” processor fault codes, the LCD in the controller can be used. Follow those steps:

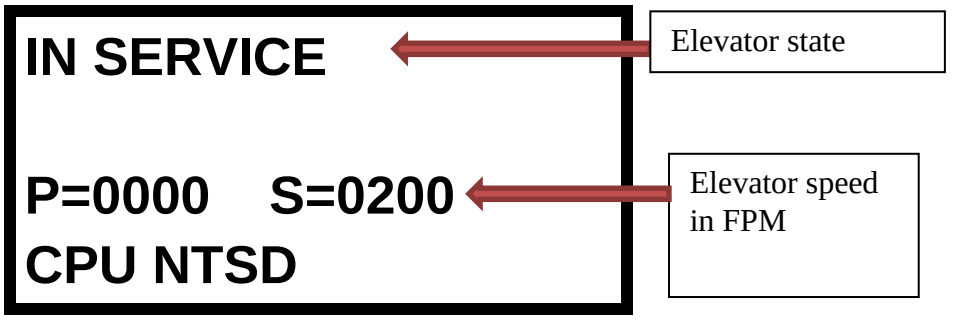
- Disconnect the LCD communication cable from the main processor CJ1M (port 232) or from the CS1W-CN118 adaptor when the LCD is connected on the peripheral port (refer to the electrical schematic).

- Connect the LCD cable to the « NTSD » CPU.





- When the LCD will detect the NTSD processor, the following screen will be displayed:



- Press « ESC » key.
- Press « UP/DOWN » key up to the menu « ALARMS & CPU I/O CHECKING ».
- Press « ENTER » key.
- Press « UP/DOWN » key up to the menu « ACTIVE FAULTS LIST ».
- Press « ENTER » key..

  To erase faults:

- Press « ENTER » key. Another message will be displayed to confirm faults erasing.

See section 13.1.5 for fault list.

9.2.7. "ETSD" aditional processor for contract speed elevators greater than 200 FPM:

Elevators with a contract speed greater than 200 FPM needs an additional processor "ETSD" and different position feedback than the normal mean as mentioned by the elevator code. This processor allows:

- To make an emergency stop at terminal landings in case of failure of the normal mean position system. The « ETSD » processor operates with « SLH » and « SLB » mechanical or magnetic switches. As soon one of those switch opens at a terminal landing with the actual speed higher than a threshold value, « ETSD » relay will open the safety circuit.

- To detect unintended car movement of the elevator. As soon as the « ETSD » processor detects an unintended car movement, the emergency brake will apply. « ETSD » relay will be deactivated.

- To detect if the elevator speed exceeds 150 FPM in inspection. As soon the elevator speed exceeds 150FPM, the emergency brake will apply. « ETSD » relay will be deactivated.

9.2.8. "ETSD" processor faults for contract speed elevators greater than 200 FPM:

When a fault is detected by the (ETSD) processor, the fault will be saved in the processor memory, here are two ways to view alarms:

See section 13.1.5 for fault list.

9.2.8.1. Fault codes indicator using "ETSD" processor outputs:

When a fault is detected by the processor, outputs 03, 04, and 05 of the "ETSD" processor will blink. The table bellow list fault codes:

Blinking fault codes				**Binary code**
Faults	**Output 03**	**Output 04**	**Output 05**	
ETSD independent positionning feedback signal lost.	ON	ON	ON	7
ETSD relay deactivated. (unintended car movement detected)	ON	ON	OFF	6
Elevator speed exceeds 150 FPM in inspection.	ON	OFF	ON	5
Processor memory battery as to be replaced.	ON	OFF	OFF	4

UDCR relay contact stuck.	OFF	ON	ON	3
Not used	OFF	ON	OFF	2
Emergency stop occured with SLH / SLB.	OFF	OFF	ON	1
No fault	OFF	OFF	OFF	0

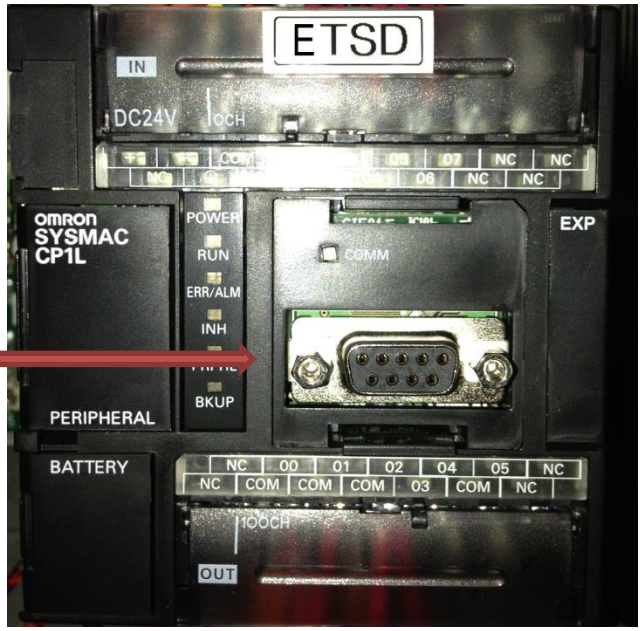
9.2.8.2. Using the LCD in the controller to access "ETSD" processor fault codes:

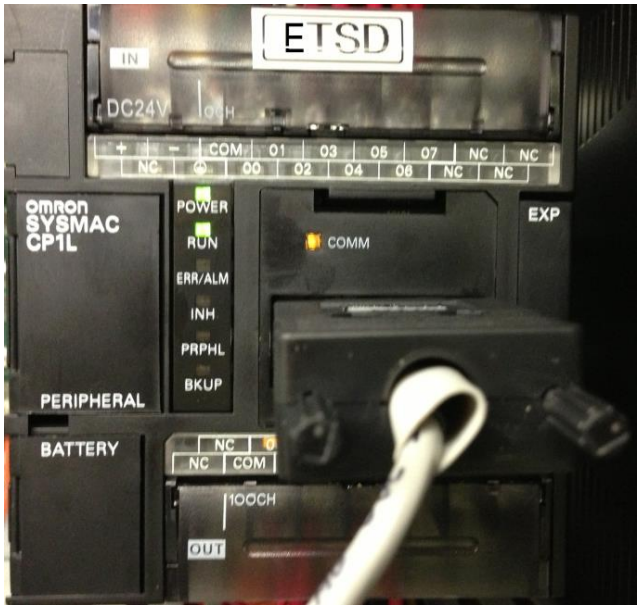
To access "ETSD" processor fault codes, the LCD in the controller can be used. Follow those steps:

- Disconnect the LCD communication cable from the main processor CJ1M (port 232) or from the CS1W-CN118 adaptor when the LCD is connected on the peripheral port (refer to the electrical schematic).

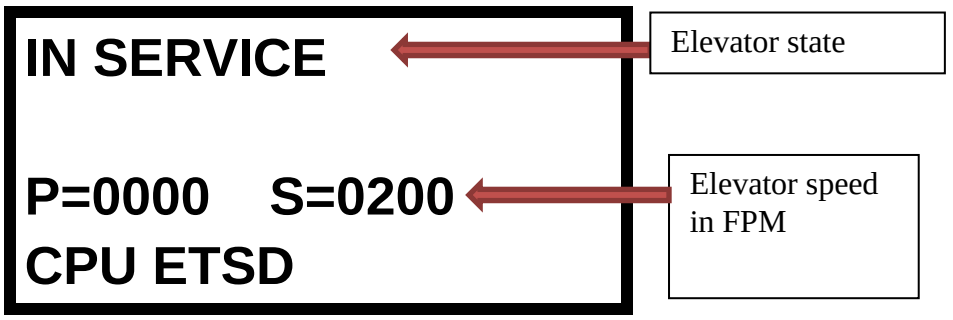
- Connect the LCD cable to the « ETSD » CPU.

Connect the LCD cable to the ETSD communication port.





- When the LCD will detect the ETSD processor, the following screen will be displayed:



- Press « ESC » key.
- Press « UP/DOWN » key up to the menu « ALARMS & CPU I/O CHECKING ».
- Press « ENTER » key.
- Press « UP/DOWN » key up to the menu « ACTIVE FAULTS LIST ».
- Press « ENTER » key.

  To erase faults:

- Press « ENTER » key. Another message will be displayed to confirm faults erasing.

See section 13.1.5 for fault list.

9.2.9. "NTSD" processor independent position feedbacks:

Elevators with contract speed greater than 200 FPM must have a second position feedback independent from the main processor position feedback as required by the elevator code. The main processor position feedback can be from the perforated tape reader (HT1 / HT2 signals) or from an encoder mounted on the governor shaft (HT1 / HT2 signals). The second independent position feedback can be from one of those two systems:

- Two proximity sensors installed above the perforated tape sensor head (« HT1B » and « HT2B » signals). To verify the good operation of that second feedback, observe the elevator speed displayed when the LCD is connected on the « ETSD » processor as explained in section 9.2.8.2.

- Two encoders mounted back to back on the governor shaft or an encoder with dual independent channels (« HT1B » and « HT2B » signals). To verify the good operation of that second feedback, observe the elevator speed displayed when the LCD is connected on the « ETSD » processor as explained in section 9.2.8.2.

- The perforated tape reader can also be used (« HT1B » and « HT2B » signals). To verify the good operation of that second feedback, observe the elevator speed displayed when the LCD is connected on the « ETSD » processor as explained in section 9.2.8.2.

WARNING : For all types of independent position feddbacks,if the position counter increases when the elevator is going down, you must reverse « HT1B »

and « HT2B » signals. Counts must increase when elevator is moving up.

9.2.10. "ETSD" Emergency terminal stopping devices parameters:

The ETSD processor computes the actual elevator speed using the independent position feedback.

Remove jumpers on "SLH" and "SLB" terminals placed in the temporary start up. Verify "SLH" and "SLB" physical position and operation. If those switches are schmersal magnetic with memory, you must move the elevator at least one time bottom to top floor in inspection.

Activate "MAINTENANCE" mode switch in the controller. When the elevator is in the middle of the building, ETSD processor inputs "SLH" and "SLB" must activated.

Internal registers to verify for proper speed calculation:

DM14: Contract speed in FPM (Adjusted in factory according to the project).

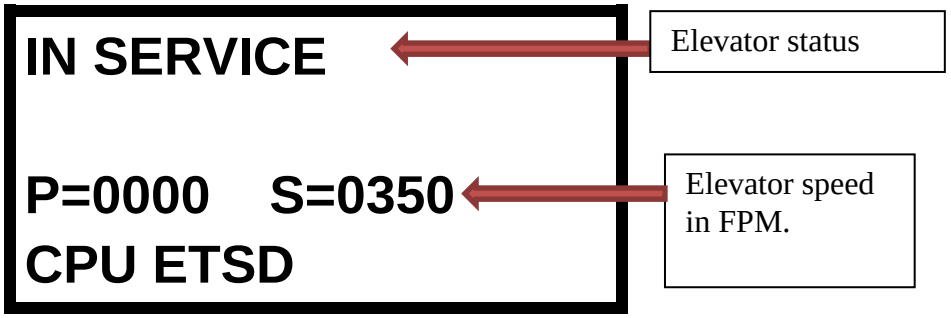
The DM14 register should be modified according to the contract speed.

Using the LCD screen see section 9.2.8.2:

- Press "ESC" and the "UP/DOWN" keys to select "REGISTER ACCESS".
- Press "ENTER".
- Choose "DM" for register type.
- Press "ENTER".
- Press the "LEFT/RIGHT" and "UP/DOWN" keys to enter 0014.
- Press "ENTER"
- Press "ENTER" to modify the value.
- Press the "LEFT/RIGHT" and "UP/DOWN" keys to enter the elevator contract speed, for example 0350, and press "ENTER" to save the modification.

When the contract speed is entered in DM14, place a car call far enough to reach the maximum speed. The LCD monitoring screen will display the actual elevator speed in FPM.

Using the LCD screen connected on the ETSD processor:



If the speed displayed is not the contract speed, register DM 0010 will have to be changed to compensate. The compensation factor is from 50 to 130%.

Emergency terminal switches adjustment :

Emergency terminal switches are placed to be activated at 24 inches from top or bottom landing. In normal mode, the ETSD processor checks if the actual elevator speed gets higher than the values written in registers DM 205 and DM 206 (factory setup at 200 fpm) when "SLH" or "SLB" are reached. If the elevator speed exceeds the tolerance value when a switch is reached, the emergency stop will be done to stop the elevator. When an emergency fault is detected, it can be possible to see the elevator speed at this moment.

Maximum speed allowed when SLH / SLB switches are reached:

DM205: if SLB has been reached higher than this speed in FPM the elevator will stop (Default 200FPM).
DM206: if SLH has been reached higher than this speed in FPM the elevator will stop (Default 200FPM).

If the elevator stops in this condition, it is possible to find out the registered speed detected.

Speeds in FPM when a fault is detected:

DM300: SLB has been reached at the speed displayed in the DM
DM304: SLH has been reached at the speed displayed in the DM

Enter 0 in the corresponding DM to reset the registers.

Also, in normal mode, it is possible de visualize the speed reached for each switch in the following registers:

Speeds in FPM when the switch is reached:

DM310: SLB has been reached at the speed displayed in the DM
DM314: SLH has been reached at the speed displayed in the DM

Enter 0 in the corresponding DM to reset the registers.

9.2.11. ETSD Emergency terminal stopping device test procedure:

Initial test at middle of the building:

- Put the elevator in Maintenance mode using the switch in the controller.
- Place a call for top landing.
- When contract speed is reached, disconnect the wire on "SLH" terminal.
- The elevator must stop immediately.
- Reconnect the wire on "SLH" terminal and press manual reset button in the controller.
- Repeat in down direction with "SLB" switch.

Test at terminal landings to see the stop distance:

- Put the elevator in Maintenance mode using the switch in the controller.
- Install jumpers on the top or bottom slowdown limits, depending on the test. To test SLH, put a jumper on LRH and LRH1 (higher than 300FPM). To test SLB, put a jumper on LRB and LRB1 (higher than 300FPM).
- Change DM0094 to "0001" in the main PLC (CJ1M).
- Place a car call at the top or bottom landing according to the test.

  Beware; the car will reach the limits at full speed, because the controller no longer reads the perforated tape pulses or the governor encoder pulses.

- Afterwards, put back the car in normal mode turning the maintenance switch to normal. The DM94 will automatically equal 0 and the perforated tape or the governor encoder will again be operational. Remove the jumpers on the slowdown limits. Press manual reset button.

10. EMERGENCY BRAKE, GTS RELAY CIRCUIT AND BUFFER TEST:

If the elevator leaves the door zone (DZO and DZO1 detectors) when the hall and car doors ar open (PP and PC relays deactivated), the GTS relay opens and requires a manual reset. The GTS relay opens under each of the following conditions:

- Loss of power on "J1" security line in the controller. This could be caused by:
  - Main power loss;
  - Speed governor tripped;
  - Redundancy detection (R5 + ETSL).

Conditions for relay GTS reset which opens the emergency brake in case of failure:

The controller keeps in memory the emergency brake application caused by the opening of the doors (PC and PP) outside the door zone (DZO or DZO1). The emergency brake will not be reset automatically. You must press on the manual reset button to reset the relay GTS.

If the relay GTS opened for any other reason, it will be reset automatically when there is a power failure on the PLC and that all of the emergency circuits are closed.

10.1. Buffer test with perforated tape of encoder:

To do the buffer test:

- Put the elevator in Maintenance mode with the switch located inside the controller.
- Put jumpers on the slowdown limit, the emergency stop limit, the normal limit and the top or bottom extreme limit according to the test.
- Put DM94 = 1.
- Place a car call to the top or bottom floor as per the test.

Be careful, the car will move in full speed on the buffer because the controller no longer reads the pulses on the perforated tape on the governor's encoder.

- Then put back the car in Normal mode with the maintenance switch in normal position. DM94 will automatically be equal to 0 and the perforated tape or the governor will again be operational.

11. INTERNAL FUNCTIONS AND CONTROLLER CONFIGURATION:

Many functions and timers may be configured and adjusted in the elevator controller. Refer to the first section of the manual to modify the registers (DM) with the LCD and to the second section to modify them with the programming toll (PRO01).

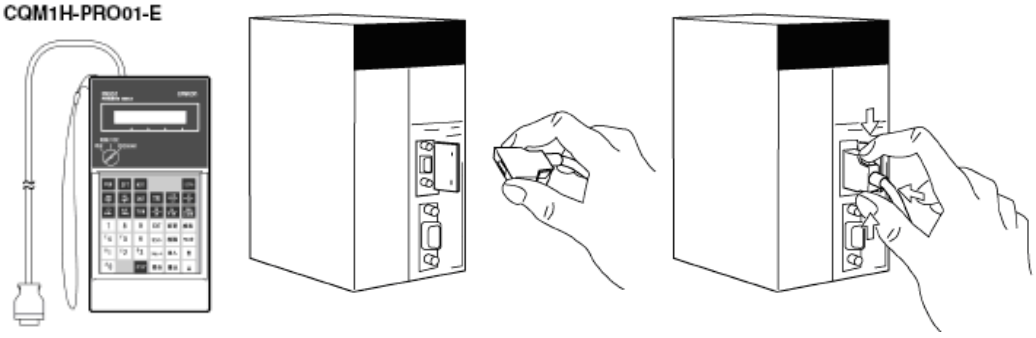
11.1. Modifying the DM with the LCD:

With the LCD screen, follow these instructions:

- Press "ESC" and the "UP/DOWN" keys to select "REGISTER ACCESS".
- Press "ENTER".
- Choose "DM" for the register type.
- Press "ENTER".
- Press the "LEFT/RIGHT" and "UP/DOWN" keys to enter the DM number.
- Press "ENTER".
- Press "ENTER" to modify the value.
- Press the "LEFT/RIGHT" and "UP/DOWN" keys to enter the new value and press "ENTER" to save the modification.

11.2. Modifying the DM with the programming tool:

Using the C200H-PRO27 or CQM1-PRO01-E, follow these instructions:



To program these functions:

- Connect the programming console C200H-PRO27 or CQM1-PRO01-E.
- Turn the key switch to "monitor" and enter the password CLR-MONTR-3. You should read "00000" on the screen. Then follow these instructions:

DM	(DM number) Example: 0074	**MONTR**
	Screen=	**D0074 0000**
CHG		**PRES. VAL? D0074 0000 ????**

- Enter state1 or 0:

1		**PRES. VAL? D0074 0000 0001**
WRITE		**D0074 0001**

The function is now programmed.

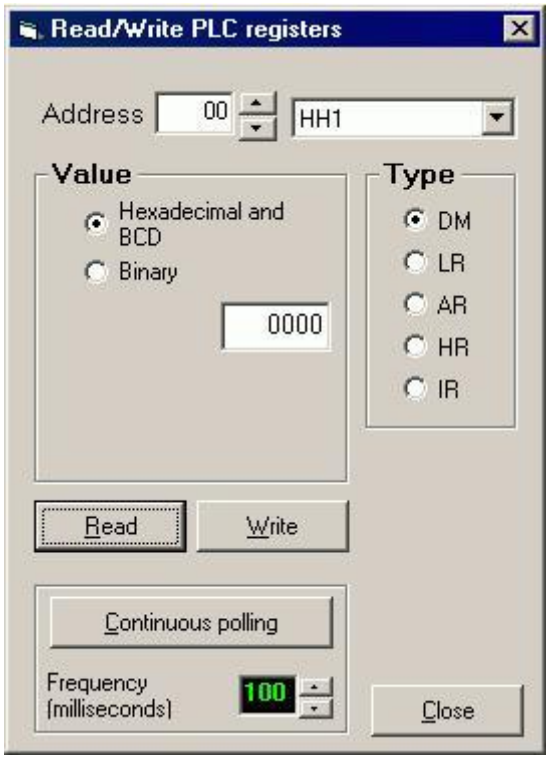
11.3. Modifying the DM or the operating time with the operator screen for the general functioning section:

Refer to the "General Functioning" section on the computer:

With the left button, click on the icon with the 2 computers and then click on "Reading/Writing plc registers…".

The following window appears and gives access to all the network's controllers that are connected. In that window, the user can select the elevator and the register type to be modified. The user can also enter the register address to modify as well as the new value and transmit it to the controller by clicking on the button "Writing". Wait for the message "SUCCES", if not, click again on "Writing".

It is also possible to visualize the register's existing value by clicking on the button "Reading". For more information use the help function of the supervision software.



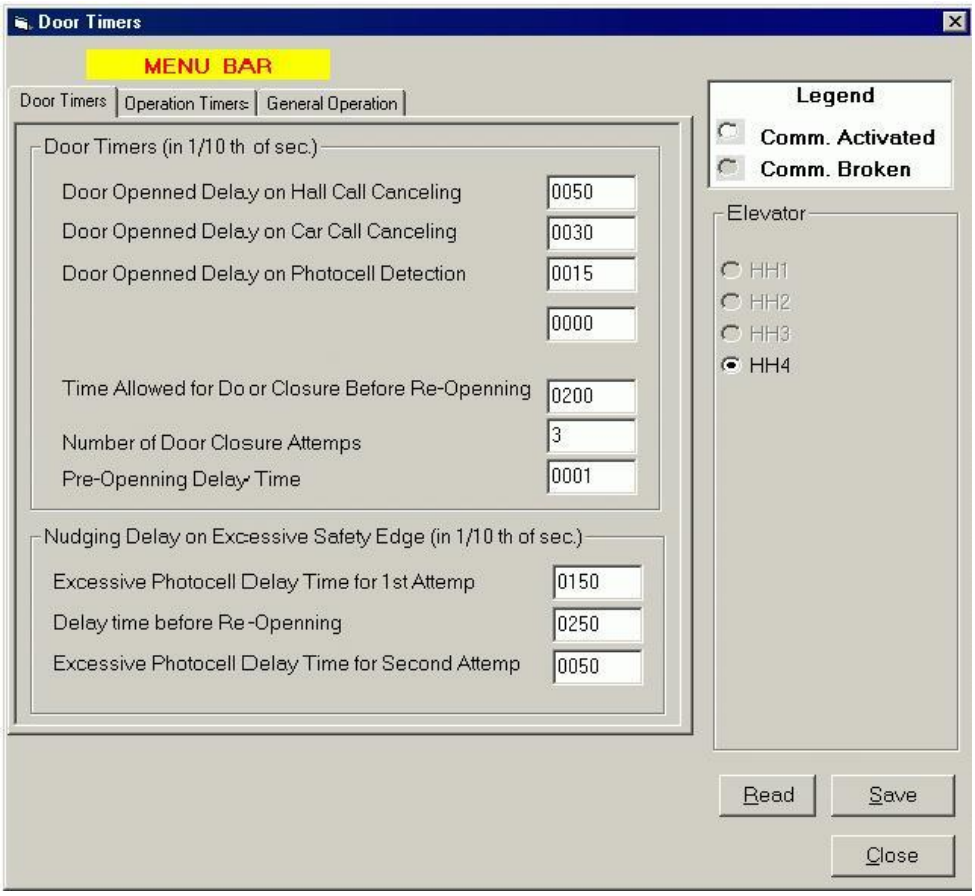
11.3.1. Time changing of certain timer with the screen operator:

It is possible to visualize and modify the different PLC's internal parameters for each elevator.

- Move the mouse cursor on the sine wave button and click on the left mouse button.

- Move the cursor on the line "ELEVATOR CONFIGURATION" and after 1 second, another menu will appear on the right.

- Move the cursor on "GENERAL" and press on the mouse left button.



This window has a tool bar offering 3 possibilities to the user.

Selecting the parameters section to modify:

Move the mouse cursor on the tool bar, on the text corresponding to the wanted section and press on the left mouse button. A list of the modifiable parameters will appear.

Reading the actual content of a PLC's parameters:

In the "Elevator" section, there is a complete list of the network elevators. The white circles indicate that the reading mode for this elevator is working. Grey circles indicate the elevator is not accessible for a distance reading (no communication).

Move the cursor on the white circle corresponding to the desired elevator and click the left mouse button. A black dot will appear.

Move the mouse cursor on the button "READ" and click on the left mouse button.

Modifying a parameter value:

Move the cursor on the field containing the value to modify and click on the left mouse button. Change the value using the keypad. Repeat the process for all parameters to modify.

Saving modified parameters:

Only the parameters in the opened window will be saved in the PLC. So, save each section one by one. Move the cursor on the button "SAVE" and click on the left mouse button. Once the transfer has been completed, the message "SUCCESS" should appear, if not, save again.

To exit the window without modifying the parameters, move the cursor on one of the buttons shown below and click on the left mouse button.

or

11.4. Control of doors:

REGISTER	DESCRIPTION	UNIT
DM0000	Door open delay on hall call. Timing begins when the door is fully opened.	0.1 sec
DM0001	Door open delay on car call. Timing begins when the door is fully opened.	0.1 sec
DM0002	Door open delay on a re-opening caused by safety edge activation or light beam interruption. Timing begins when the door is fully opened.	0.1 sec
DM0032	Door closure delay beyond which the door will reopen if they are not completely closed. (Activated only if DM87=1).	0.1 sec
DM0092	Extended door open time at lobby. DM0173. (yes = 1 no = 0).	n/a
DM0173	Door open delay if the 25% weight limit (LW3) is not activated. Timing begins when the door is fully opened. Activated only if DM92 = 1. The "Door close" button is not operational at the main floor if the weight limit LW3 is not reached.	0.1 sec
DM0033	Protection on closing of doors. Number of times (counter) that the doors will try to close before the elevator is out of service. Activated only if DM87 = 1 (DM33 factory set to 5).	
DM0034	Door opening delay beyond which the door will re-close; for instance, if the door did not reach full opening or if the DOL limit has not been activated. This counter doesn't need to be adjusted because it is automatically according to DM0000.	0.1 sec
DM0060	FDOL / RDOL signals off delay applied when the contact opens.	0.1 sec
DM0061	FDCL / RDCL signals off delay applied when the contact opens.	0.1 sec
DM0066	Door photocell interruption delay beyond which the door will be forced to close slowly in nudging.	0.1 sec
DM0067	Delay before door re-opening during nudging, if the door cannot close completely.	0.1 sec
DM0068	Delay between the second attempts to close the door in nudging.	0.1 sec
DM0077	Door close button simulation when a new car call is registered. (Yes=1, no=0)	n/a
DM0035	Delay before door closing on a new call, if DM 77 = 1	0.1 sec
DM0080	Door pre-opening in leveling zone. (Yes = 1 no = 0)	n/a
DM0084	Door nudging. (Door closing at low speed) (Yes = 1 no = 0)	n/a
DM0087	Door closing protection. If the door cannot close properly, it automatically re-opens and re-closes. The door will try to close the number of times set in DM33 (5 times) and then the door will no longer close and the car will be in fault and will no longer take calls. (yes = 1 no = 0).	n/a
DM0088	Delay before door opening in the door zone if pre-opening activated.	0.1 sec

If there is simultaneously a stop on car call and on floor call, the floor timer will be predominant.

11.5. Variable speed drive:

REGISTER	DESCRIPTION	UNIT
DM0008	Too long travel protection.	0.1sec
DM0017	Time allowed for the elevator to reach the next floor if there is a problem with the perforated tape.	0.1sec
DM0045	Field magnetization delay before brake opening.	0.1sec
DM0046	Delay before the brake drops to pass from 7 FPM to zero in leveling at a floor stop.	0.1sec
DM0047	Delay before deactivating the drive at floor stop.	0.1sec
DM0049	Car stop delay on drive fault. If the controller does not receive a drive run confirmation before the DM0049 delay, the car will be put out of order. (trouble H8206).	0.1sec
DM0076	Delay before the acceleration begins after brake opening..	0.1sec
DM0078	Delay before releasing the motor contactor "M". The timer begins after the delay in DM 0047.	0.1sec
DM0150	Number of drive reset.	n/a

11.6. Brake:

REGISTER	DESCRIPTION	UNIT
DM0044	Delay before voltage reduction after brake pick up if there is a relay HLD.	0.1sec
DM0050	125% brake test for room less machine. If 1111, inspection buttons to open the brake, drive is off but uncontrolled speed detection is operational. “BRK” = off.	n/a
DM0178	Time allowed for brake opening at start. (fault HR 8211)	0.1sec
DM0179	Number of starts without opening of the brake.	
DM0180	Time allowed for brake closing. (fault HR8211)	0.1sec
DM0181	Re-leveling counter in the door zone. After DM0181 counts, the rope gripper will be applied. (fault HR8213)	
DM0182	Brake switch input installed. (Yes = 0, No =1234)	n/a
DM0282	Brake switch contact NO/NC. (0 = normally closed, 1= normally opened)	0 or 1

11.7. Floor calls:

REGISTER	DESCRIPTION	UNIT
DM0020	Delay beyond which car calls and hall calls are cleared if the car has not moved to another floor.	0.1sec
DM0082	Number of car calls limited to the value stored in DM83. (Yes = 1 No = 0)	n/a
DM0083	Maximum number of car calls allowed versus the amount of weight measured by the photocell (PH).	n/a
DM0089	Each time the car reaches the top or bottom floor, all car calls are cancelled. (Yes =1 No = 0)	n/a
DM0090	Car calls for in reverse direction not allowed. (Yes =1, No = 0)	n/a

11.8. Gong:

REGISTER	DESCRIPTION	UNIT
DM0022	Door opened gong time if the door is still opened.	0.1sec

DM0023	Door opened gong time. (Manual door)	0.1sec
DM0038	Car calls acknowledgement pulse duration. (activated by DM 0086 = 1)	0.1sec
DM0040	Passing gong pulse time.	0.1sec
DM0043	Delay between 2 passing gong pulses.	0.1sec
DM0081	Passing gong activation. (Yes = 1 No = 0)	0.1sec
DM0085	Passing gong, 2 pulses in down direction. (Yes = 1 No = 0)	n/a
DM0086	Car calls acknowledgement activation. (Yes =1 No = 0)	n/a
DM0169	Time before turning off direction arrows if no movement.	minutes

11.9. Position indicator + SU/SD direction:

REGISTER	DESCRIPTION	UNIT
DM0028	SU and SD direction will stay activated during door closing and during reopening. Door opening on direction reversing, if = 1	n/a
DM0039	If = 0001, Floor designation when passing each landing If = 0000, Floor designation upon arrival at each landing only	n/a
DM0126	= 0000, standard indicator (one light per floor) = 0001, binary indicator A, B, C, D	n/a
DM0160	0000 = No flashing code on the position indicator 0001 = Flashing code to indicate inspection, independent service and phase 1 > 2 = Flashing code on the position indicator for long time out of service	n/a
DM0161	Flashing code to indicate the independent service mode	n/a
DM0162	Flashing code to indicate the phase 1 mode	n/a
DM0163	Flashing code to indicate the inspection mode	n/a
DM1301 and +	Code number that correspond to BZ (1 to 32)	n/a

11.10. Emergency recall:

REGISTER	DESCRIPTION	UNIT
DM0098	Main floor recall level.	Floor
DM0099	Alternate floor recall level.	Floor
DM0148	Main floor door selection on phase 1. (0 = Front door, 1 = Rear door)	n/a
DM0149	Alternate floor door selection on phase 1. (0 = Front door, 1 = Rear door)	n/a
DM0051	On fire in the machine room FMR, if the machine room is at the same level as the main floor, put 1 in the DM. The car will move to the alternate floor.	n/a
DM0056	On fire in hoistway FH, if the elevator must go to the main floor, put 0 in the DM and put 1 if the car has to move to the alternate floor.	n/a
DM0151	Fire buzzer turn off delay	0.1sec
DM0152	Fire signals reversing FS, ALT, FH, FMR (1234 = inputs deactivated initialize the fire sequence, 0000 = inputs activated initialize the fire sequence)	n/a
DM0153	ALT signal delay (0 to 1.0 sec.) If = 1234, this fire signal is not used	0.1sec
DM0154	FMR signal delay (0 to 1.0 sec.) If = 1234, this fire signal is not used	0.1sec
DM0155	FH signal delay (0 to 1.0 sec.) If =1234, this fire signal is not used	0.1sec

11.11. Emergency power operation:

REGISTER	DESCRIPTION	UNIT
DM0091	Max. speed, (2 floors and +) allowed on emergency power. (Yes = 0 no = 1)	n/a
DM0285	GEN1 and GEN2 signals reversing on normal power. (0 = N.O. 1= N.C).	n/a
DM0405	Number of elevators to control during emergency power operation.	n/a
DM3100	1st elevator of the group to return the main floor.	n/a
DM3101…	2nd elevator of the group to return the main floor.	n/a
DM3110	1st elevator of the group that returns in automatic mode after all elevators are at the main floor. With the separate dispatcher, the CJ1M IO uses the same registers.	n/a
DM3111…	2nd elevator of the group that returns in automatic mode after all elevators are at the main floor if the first one before is faulty. With the separate dispatcher, the CJ1M IO uses the same registers.	n/a

11.12. Priority service (Blue code and free car):

REGISTRE	DESCRIPTION	UNITÉ
DM1412	Blue code reset timer if no movement was detected. (protection)	0.1sec
DM1413	Blue code, time allowed to turn the key inside the car before returning to automatic operation.	0.1sec
DM1421	Free car, operation buzzer off delay when arriving at the hall call level.	0.1sec
DM1422	Free car, delay before car call acceptance when arriving at the floor, door opens.	0.1sec
DM1423	Free car, delay before returning to automatic operation if no car calls entered.	0.1sec
DM1425	Free car, final delay upon arrived at destination. After that delay, the car returns in automatic.	0.1sec

11.13. Positionning/speed/bottom switches:

REGISTER	DESCRIPTION	UNIT
DM 0029	Disables the sensors of code bar (P1, P2, P3, etc.) (Disable = 1234 Activated = 0)	n/a
DM 0094	Buffer test sequence allowed in maintenance. (1= Activated)	n/a
DM 0132	Hole number for deceleration distance for one floor run rides. (posi1000, position indicator level switching distance)	Holes
DM 0133	Hole number for deceleration distance for two floor run rides and more.	Holes
DM 0255	Bottom hoist way access zone distance (0.75’’/ hole).	Holes
DM 0256	Top hoist way access zone distance (0.75’’/ hole).	Holes
DM 0059	Bottom hoistway access is limited by "USL" of the floor above if equal 1. Bottom hoistway access is limited by "DZO" of the floor above if equal 0.	n/a
DM 0062	Top hoistway access is limited by "DSL" of the floor below if equal 1. Top hoistway access is limited by "DZO" of the floor below if equal 0.	n/a
DM 0063	Activate hoistway access limit with the magnetic swithces (DZO or USL or DSL).if equal 1. If is not a perforated tape, external switches is required to limit the access movement.	n/a
DM 0290	Actual elevator speed.	FPM

REGISTER	DESCRIPTION	UNIT
DM 0483	Number of floors registered during the hoist way learning.	n/a.
DM 0490	Elevator actual floor position in holes. (0.75''/ hole)	Holes
DM 0492	Floor learning sequence activation. (Yes = 1234, No=0) (inspection)	n/a
DM 5800	CJ1M, absolute position from 0 to 10 000 000 encoder pulses or perforated tape.	n/a
DM 5801		n/a

11.14. Others:

REGISTER	DESCRIPTION	UNIT
DM0183	Motor thermal contact activation "THM ". (Yes = 0, No =1234)	n/a
DM0074	Automatic reset of the rope gripper. (Yes =1, No = 0)	n/a
DM0249	Construction mode activation in inspection, if = 1 Reset as soon as the elevator returns in normal mode.	n/a
DM0258	If = 0, car stop switch input "SA" off on normal operation. If = 1, car stop switch input "SA" activated on normal operation.	n/a
DM0275	Number of movements before the alarm buffer reset (HR80 to HR87).	n/a

11.15. Return to simplex and duplex controller parking:

REGISTRE	DESCRIPTION	UNIT
DM0024	Delay before the elevator returns to the parking floor. (activated by DM95 or STA key, DM 1003 and DM 1004 duplex)	0.1sec
DM0170	Time before parking return during peak hour.	0.1sec
DM0095	Parking return activation. (Yes = 1 No = 0)	n/a
DM0096	Parking door opened. (No = 0 Yes = 1) (Simplex only)	n/a
DM0097	Parking floor level (Simplex only) 1, 2, 3, 4, 5, etc. To program the floor level, enter the wanted level in DM97. Example: for a parking at level 2, put 2 in DM97. If it's 0, the processor will automatically put 1. If it's a number higher than the total number of floors, the processor will put the top floor.	Floor
DM1003	1st parking level. (Duplex to program in car # 1) DM 1003 and DM 1004 = 0 so no parking	n/a
DM1004	2nd parking level (Duplex to program in car # 1).	n/a
DM1009	Parking door opened for 2 car group. (bit 0 = BZ, bit 15 = 16Z) Must be programmed in both controllers.	n/a
DM1200	Parking door opened for 3 car group and more. (bit 0 = BZ, bit 15 = 16Z) Must be programmed in all controllers.	n/a

11.16. Home parking for two-car group controllers duplex:

When two PLCs are networked together through RS232 communication cable, the controller #1 works as the dispatcher. DM95, DM96 and 97 are not used in this case because it is not a simplex controller anymore. Parking floors are programmed in controller #1 only, and are dispatched as followed

- Two priority levels can be programmed. The first car without any call will park itself at the first parking floor level (priority) programmed in DM1003. If the second car becomes also free of any call, it will be assigned to the second parking floor level programmed in DM1004.

How to program parking floors (duplex controllers):

The values to be stored in DM1003 and DM1004 are the numbers corresponding to the parking floor desired. (For example, 3 for the third levelling the building).

- No parking floor required the two cars be to be parked at random. DM1003 = 0000 DM1004 = 0000.

- One car only parks itself (for example at the second floor) and the other one is parked at random. DM1003 =2 DM1004 = 0000.

- The first available car parks itself at the second floor and the other available car parks itself at the fourth floor. DM1003 = 0002 DM1004 = 0004.

  We recommend the second option and to park a car at the ground floor. The controllers are set in factory with this option.

  The delay before returning to the parking floor is stored in DM24 and must be programmed in both controllers.

Home parking with door opened:

In each controller, DM1009 allows you to program the floor levels where you want the car to park, open its door and keep it opened.

- To see and change those floors levels with the LCD screen, proceed as followed:

  - Press "ESC" and the "UP/DOWN" keys to select "REGISTER ACCESS".
  - Press "ENTER".
  - Select "DM" for register type.
  - Press "ENTER".
  - Press the "LEFT/RIGHT" and the "UP/DOWN" keys to enter 1009.
  - Press "ENTER".
  - Press "ENTER" to modify the value.
  - Press on the "LEFT/RIGHT" and "UP/DOWN" keys to enter 0002 and press "ENTER" to save the modification.

  Ex: parking at the 2nd floor

DM1009=0002 **0000000000000010**

Ex: parking at the 7th floor

DM1009=0040 **0000000001000000**

The bit at the far right (Bit 00) corresponds to the bottom floor of the building. The bit at the far left (Bit 15) corresponds to the 16th floor of a building.

Example:

The parking floors in a building are the 2nd floor (ground floor) and the 4th floor (cafeteria). The user wishes that the doors stay opened only at the second floor.

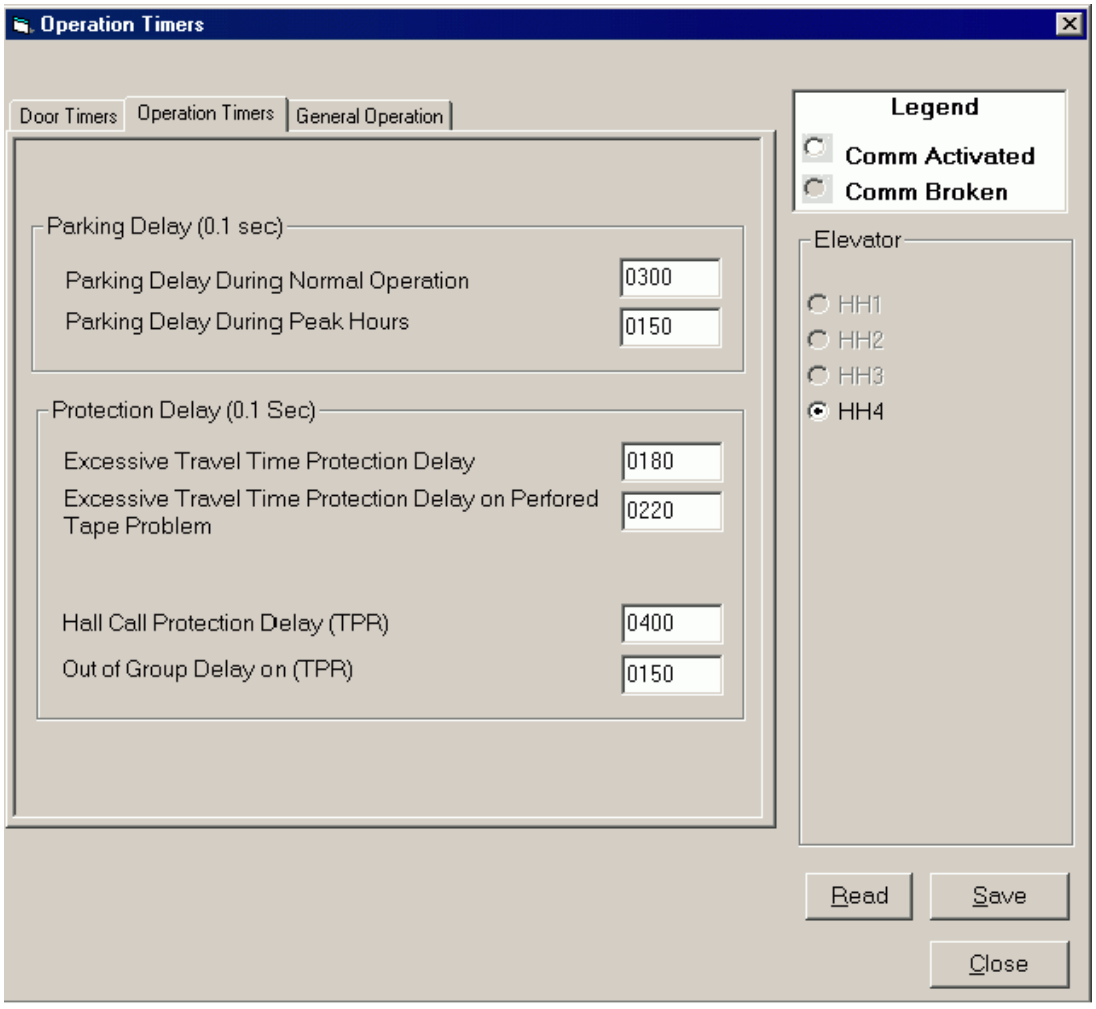
The value to enter will be:

DM1009=0002 **0000000000000010**

The setting of DM1009 must be done in both controllers (Controllers #1 and #2).

11.17. Home parking for group controller with operator screen:

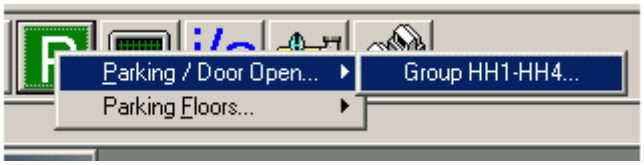
The car parks after the DM0024 time as soon as it receives authorization from the dispatcher. The delay is adjustable with the operator screen in the OPERATION TIMER section.



Level and parking doors state configuration with operator screen:

This option allows specifying to each elevator the state of the door when at parking level.

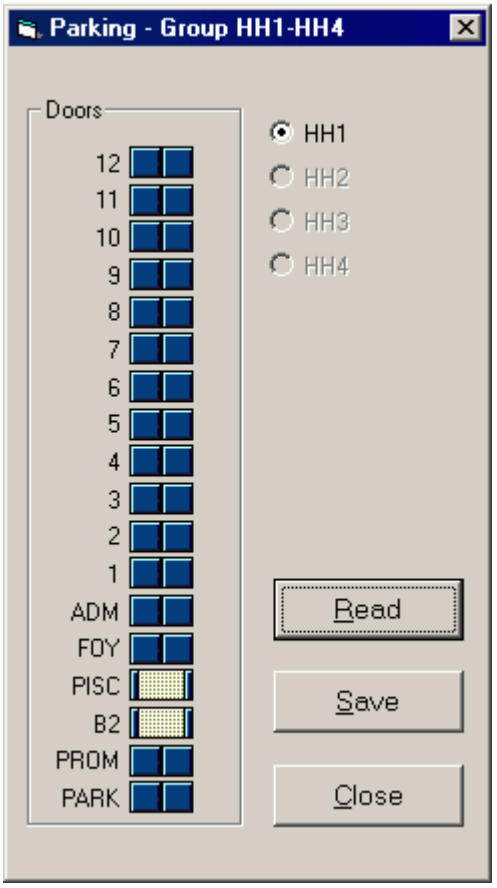
- Move the cursor over the menu option that shows the letter "P" and click on the left mouse button.



- Move the cursor on the "Opened doors parking". Wait a moment, and the elevators list should appear on the right.
- Move the cursor horizontally to the menu on the right and choose the group that the desired elevator is part of. In the case of a simplex, choose the name of the elevator.
- Click on the left mouse button.

11.17.1. Opened doors parking for groups with dispatcher:

In the following example, the door will permanently stay opened on the second floor, until it receives a hall call.



When the selected elevator is part of a group, move the mouse cursor in the corresponding white circle and click the left mouse button. A black dot should appear.

Move the cursor on the "READ" button and click the left mouse button.

To see and change the door state:

- Move the mouse cursor on the door picture at the desired level.
- Click once the left mouse button to open the door and a second time to close it.
- When the state of the door is determined, move the mouse cursor over the "SAVE" button and click the left mouse button. The message "SUCCESS" should appear at the top of the window. If not, save again.

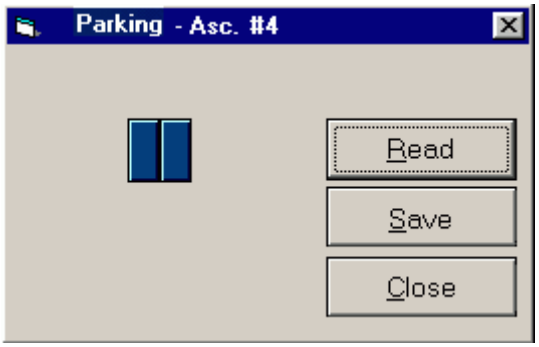
Repeat this operation for each elevator in the group.

- To exit the menu, move the cursor on either one of those buttons shown below and click on the left mouse button.

or

11.17.2. Opened doors parking for simplex elevators:

When the selected elevator is not part of a group, there can only be one parking level. Indicate the state of the doors when the elevator will be at this level.



To see and change the door state:

- Move the cursor over the "READ" button and click the left mouse button.

- If a change has to be made with the state of the door, move the cursor over the button showing a door.

- Click once the left mouse button to open the door, and a second time to close it.

- When the state of the door is determined, move the cursor over the "SAVE" button and click the left mouse button. The message "SUCCESS" should appear at the top of the window. If not, save again.

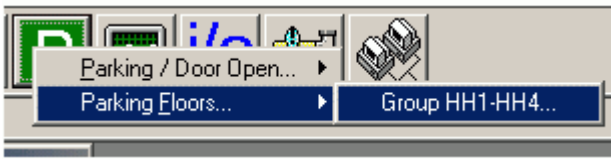
- To exit the menu, move the cursor over one or the other of the buttons shown below, and click the left mouse button.

or

11.17.3. Parking floors:

This option in the menu allows indicating to each group or simplex elevator the desired parking levels.

- Move the cursor on the menu option that shows the letter "P", and click the left mouse button.



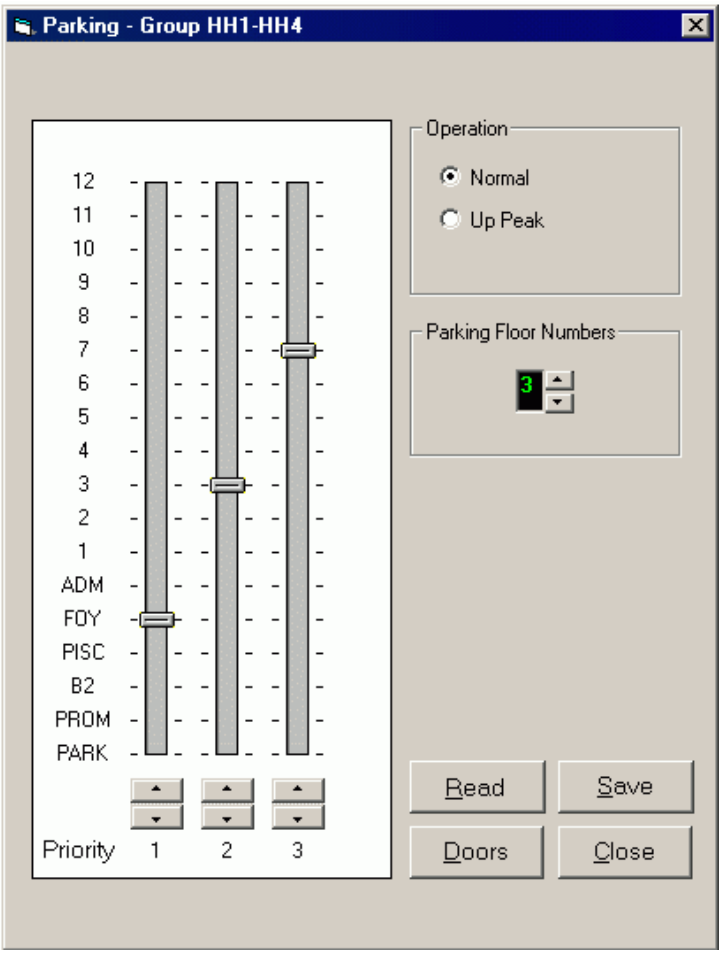
- Place the cursor on the "PARKING FLOORS" line. After a moment, the list of all the groups and simplex elevators should appear on the right.

- Move the mouse cursor horizontally on the name of the group or elevator desired.

- Click the left mouse button.

Parking floors for groups with dispatchers:

Parking levels dispatch works on a priority basis. The first available car will receive parking level priority 1. If a second car becomes available, it will receive priority 2. If a third car becomes available, it will receive priority 3.



Configure the grid in a "NORMAL" operation mode or in an "UP PEAK" period for a duplex or group with a separate dispatcher.

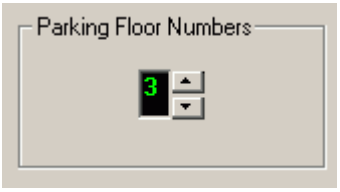
It is possible to decide how many parking floors there will be.

Selecting an operation mode:

Move the mouse cursor on the white circle at the left of the operation mode to modify, and click the left mouse button. In the example above, the "NORMAL" mode is selected.

Changing the number of parked cars:

Move the mouse cursor on either arrow in the "PARKED CARS" section. Each time you click the left mouse button, the number will go up or down.



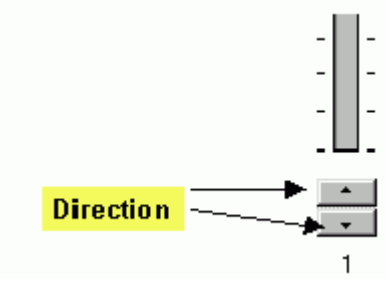
If the number goes down, elevators will disappear from the vertical columns.

In the example shown above, the priority 1 elevator will park at the 5th floor, and a second one will park at the 9th floor in priority 2. The third one will park at the 13th floor in priority 3. If you have nothing, the car will remain at the same floor where it answered its last call (floating car).

Changing parking levels:

Move the mouse cursor over the up or down arrows located under the corresponding priority vertical bar.

Each time you click the left mouse button, the cursor representing the elevator will either go up or down accordingly. Adjust until you reach the right parking level. Repeat for the other priorities.



To transfer the parking floors in the dispatcher:

Move the mouse cursor on the "SAVE" button and click on the left mouse button.

The "SUCCESS" message should appear. If not, save again.

This button allows accessing directly the "OPEN DOOR PARKING" menu.

To exit the window without modifying the parameters, move the mouse cursor on either one of those buttons and press the left mouse button.

or

11.18. Up peak period (optional) for group controller (with separate dispatch):

The group assigns parking levels. Refer to the screen operator user's manual.

11.19. Down peak period (optional) for group controller (with separate dispatch):

The group assigns parking levels. Refer to the operator screen user's manual.

11.20. Next car up (for group controller with separate dispatch only):

DM166 = 0 No "next car up"

DM166 = 1 Next "car up" in service.

When it is active, a car will be selected to go up from the ground floor. The doors will stay opened and the direction arrow will be activated in up direction.

11.21. Up peak period for a two-car group controller (without separate dispatch):

When a two-car group controller is provided with this option, the up peak period may be initiated. Both controllers may initiate automatically an up peak period by continuously monitoring up calls in the building.

The parking floors have to be programmed in the controller #1 only: priority #1 = DM1005, priority #2 = DM1006.

When the building is going through an up peak period, only the parking floors are changed for that period. If "0000" is stored in DM1005 and DM1006, the up peak operation is disabled.

Programmed up peak:

- Priority #1 (DM1005) = the first available car will park at the level entered in DM1005. Example: 2 in the DM1005 = 2nd floor of the building.

- Priority #2 (DM1006) = the second available car (while the other is already at the level for priority #1) will park at the level entered in the DM1006. Example: 1 in the DM1006 = first floor of the building.

Setting the parameters for up peak operation in controller #1:

- The number of up calls for BU, 2U and 3U floors necessary to initiate an up peak period.

There is a counter assigned to each one of those three floors that cumulates every call registered on its specific floor. If one of those counters reaches the value stored in DM1039 within the time lapse stored in DM1040, an up peak period is initiated.

A time lapse has to be determined to periodically reset the counters (DM1040).

Example:

DM1039 = 0005 = 5 calls within the time lapse

As soon as one of the counters reaches 5 calls within the time lapse, an up peak period is initiated.

- Lapse of time allowed cumulating calls on BU, 2U, and 3U floors.

  The lapse of time allowed to cumulate the calls is stored in DM1040 in tenths of seconds.

  Example:

  DM1040 = 1200 = 120 sec. therefore, 2 minutes

  Every 2 minutes, call counters on BU, 2U, 3U floors are reset

- Up peak period duration when it has been triggered automatically.

  The duration of the up peak period is stored in DM1041 in minutes.

  Example:

  DM1041 = 0003 = 3 minutes period of time

  So, for the 1st method, you have to program only DM1005 and DM1006; for the 2nd method, you have to program DM1005, DM1006, DM1039, DM1040, and DM1041

11.22. Down peak period for two-car group (without separate dispatch):

When a two-car group controller is provided with this option, the down peak period may be initiated. Both controllers may initiate automatically a down peak period by continuously monitoring down calls in the building.

The parking floors have to be programmed in the controller #1 only: priority #1 = DM1007, priority #2 = DM1008.

When the building is going through a down peak period, only the parking floors are changed for that period. If "0000" is stored in DM1007 and DM1008, the down peak operation is disabled.

Programmed down peak:

- Priority #1 (DM1007) = the first available car will park at the level entered in DM1007. Example: 7 in the DM1007 = 7th floor of the building.

- Priority #2 (DM1008) = the second available car (while the other is already at the level for priority #1) will park at the level entered in the DM1008. Example: 10 in the DM1008 = 10th floor of the building.

Setting the parameters for up peak operation in controller #1:

- The total number of down calls for all floors necessary to initiate a down peak period.

  A counter cumulates every down call registered on all floors. If that counter reaches the value stored in DM1035 within the lapse of time stored in DM1036, a down peak period is initiated.

  A time lapse has to be determined to periodically reset the counters (DM1036).

  Example:

  DM1035 = 0015 = 15 calls during lapse of time.

  As soon as the counter reaches 15 calls within the lapse of time, a down peak period is initiated.

- Lapse of time allowed cumulating total down calls.

  The lapse of time lapse allowed to cumulate the calls is stored in DM1036 in tenths of seconds.

  Example:

  DM1036 = 1200 = 120 sec. So, 2 minutes

  Every 2 minutes, the down-call counter is reset.

- Down peak period when it been triggered automatically.

  The duration of the down peak period is stored in DM1037 in minutes.

  Example:

  DM1037 = 0003 = 3 minutes lapse of time

  So, for the 1st method, you have to program only DM1007 and DM1008; for the 2nd method, you have to program DM1007, DM1008, DM1035, DM1036, and DM1037.

  For duplex controllers, the functions must be programmed in both controllers individually, except for the DM1003, DM1004, DM1005, DM1006, DM1007, DM1008, DM1035, DM1036, DM1037, DM1039, DM1040 and DM1041, which must only be programmed in controller #1.

11.23. Traction lost test and description

The elevator control processor compares the travel distance done by the motor encoder feedback and the position encoder (perforated tape or governor encoder) continuously to detect if cables slides on the motor sheave more than a threshold value.

The register DM 5730 indicates the actual error in counts (3/4" per count) between both feedbacks. The error value should oscilates between 0 and 1 in normal operation when no cable slides on the sheave. On a high rise building, 1 or 2 inches can be observed on a normal long distance travel.

The register DM 263 contains the error level allowed for the entire travel. The error threshold should not be too tight to avoid intermittent tripping.

During the floor learning sequence, the controller computes the motor encoder pulse conversion factor. This factor is saved in the register DM 336. On multiple car group, you can compare the DM 336 with the other cars. All the cars with the same configuration must have the same conversion factor.

TEMPORARY DISABLING:

To turn off temporary the traction fault detection on a perforated tape reader problem, you can put DM 263 at 9999. The error is still calculated but will not stop the elevator. Fixe the problem and bring back the DM 263 at 0032.

To perform the test, follow those steps:

1- Place the car in maintenance mode with the switch in the controller.

2- Reduce the conversion factor for the motor feedback to simulate an error between both feedbacks.
Go to "Register access" menu and write down the value of register DM 336 and change the third digit by minus one. Example DM 336 = 0A32, change to 0932 (digit changes from 0 to 9, A, B, C, D, E, F).

3- The controller is now ready to simulate a traction lost.

4- Place the car call in up or down direction or move in inspection mode. Monitor the register DM5730 for the actual error between both feedbacks.

5- The controller will stop the elevator at the next floor when the error exceeds the register DM 263, set at factory to 32 counts (24 inches). When the elevator will stop at the floor, the elevator will not allow placing car calls and hall calls.

6- To restart: put back the original value in the register DM 336. Turn the "**TRACTION LOST RESET"** key switch to restart the elevator control.

11.24. Light curtain test for vertical sliding freight doors

Code section 2.13.3.4.9, the system that detects objects must be checked when the door has reached its fully opened position. In automatic, open both car and hall doors. Disconnect the light curtain wire on terminal "**PH**". Give a close command. The "**LCT**" relay will energize momentarily and the controller will detect a malfunction and keeps door opened. An alarm will be generated and calls will not be accepted. Reconnect the wire and press the **"MANUAL RESET"** button to restart the elevator control.

12. SYMBOLS LISTING:

150F:	150 FPM speed limiting device monitoring
2D-3D, 4D…:	Down hall calls
ALT:	Alternative floor recall on fire alarm
BAC:	Car stop bypass
BC-2C.3C…:	Car calls
BU-2U, 3U…:	Up hall calls
BZ-2Z, 3Z…:	Car zone
BDS:	Safety edge
BR:	Brake relay
BRC:	Brake contact
BRK:	Brake relay
BUZ:	Phase 1, nudging, car call acceptance buzzer
CCA:	Car call recording bip
CDS:	Counterweight displacement switch
CL:	Door closing contactor
DCA:	Down direction relay
DCL:	Closed door limit switch
DSL:	Down slowdown signal (Elevator 150 FPM and -)
DOL:	Opened door limit switch
DZO:	Door zone
DZO1:	Door zone
GD:	Car gong with down arrow light
GEN1:	Emergency generator relay
GEN2:	Emergency power pre-signal
GP:	Passing gong
GU:	Car gong with up arrow light
ETSD:	Emergency terminal stopping device relay (elevators with contract speed hier than 200 FPM).
ETSD processor:	Emergency terminal stopping device (elevators with contract speed hier than 200 FPM).
FMR:	Fire machine room alarm
FS (input):	Main floor recall on fire alarm
FS (output):	Low speed nudging relay
GTS:	Rope gripper control relay
HDL:	Landing door locked
HLD:	Mechanical brake holding voltage relay
HT1/HT2:	Perforated tape high-speed counter signals
INC:	Phase 1 activated

ISR:	Inspection relay
K:	Close front door button
LD:	Down levelling
LEB:	Bottom final terminal stopping switch
LEH:	Top final terminal stopping switch
LNB:	Down normal limit switch
LNH:	Up normal limit switch
LRH:	Top landing normal slowdown limit switch
LRH1:	Top landing normal slowdown limit switch (300-400 FPM elevators)
LRB:	Bottom landing normal slowdown limit switch
LRB1:	Bottom landing normal slowdown limit switch (300-400 FPM elevators)
LU:	Up levelling
M:	Main contactor
M1:	Auxiliary main contactor
MA:	Drive enable relay
MT:	Off delay on "M" contactor at each elevator stop
NTSD:	Normal terminal stopping relay at top or bottom landing (elevators 200 fpm and faster)
NTSD processor:	Normal terminal stopping device at top or bottom landing (elevators 200 fpm and faster)
NUD:	Nudging buzzer
OP:	Door opening contactor
OK1, OK2,…:	Signals indicating the presence of each car when dispatcher failure, only in groups
PC:	Car door relay
PH:	Door photocell
PP:	Landing door relay
PR:	Potential relay
PS1:	Levelling speed in door zones (7 FPM)
PS2:	Controller inspection speed (50 FPM)
PS1 + PS2:	Top of car inspection speed (maximum 150 FPM)
PS4 + PS1:	One floor run speed (for elevators running at 300 and 400 FPM)
PS4 + PS2:	High speed
SA:	Car stop switch signal
SCS:	Seismic switch signal
SD:	Car going down
SI:	Independent service
SLH:	Top speed limiting device
SLB:	Bottom speed limiting device
SPE:	Vocal annociator enable
SPR:	Security line relay

SU:	Car going up
R5:	Trouble redundancy relay
RBDS:	Rear safety edge
RCL:	Rear door closing contactor
RDCL:	Rear closed door limit switch
RDOL:	Rear opened door limit switch
RDY:	Fault drive relay
RK:	Rear door close button
ROP:	Rear door-opening contactor
RPH:	Rear door photocell
RRC:	Redundancy relay check at every start
RSD:	Drive reset relay
RSR:	Rope gripper reset relay
TBBH:	Test Bypass holding voltage relay
THM:	Motor thermal contact
UCA:	Up direction relay
UCM:	unintended car movement relay
UDC:	Working relay
UG1,UG2:	Emergency power selector
USL:	Up slowdown signal (Elevator 200 FPM and -)
XIN, XIN1:	Hoistway access relay

13. MAINTENANCE:

13.1. Alarms and faults:

13.1.1. Alarms and status list:

The PLC memorizes several alarms and status which can be seen using the LCD screen.

All status and alarms are memorized in retentive registers "HR" and will be retained on a power loss.

To erase des alarms (3 ways):

- Hold the « MANUAL RESET » button, located on the controller inspection board, for 2.5 seconds. This action reset the controller if every conditions are good and clear the alarms.
- Activate the "MAINTENANCE" switch 4 times in a row.
- By using the LCD, erase the alarms and then consult the alarms list to check that there are no more. See LCD operation instructions section.

13.1.2. Fault list access in the CJ1M PLC controller:

If a fault occurred, the corresponding bit will be put at 1. To acces the fault list, proceed as followed (See section 13.5 for complete faults list description):

To access the fault list in the LCD display:

- Press "ESC" to return to the previous menu.
- Press "UP/DOWN" keys to select the main menu "ALARMS & CPU I/O CHECKING".
- Press "ENTER".
- Press "UP/DOWN" keys to select the sub menu "ACTIVE FAULTS LIST".
- Press "ENTER".

To erase faults (3 ways):

- By using the LCD, erase the alarms by pressing “ENTER” twice.
- Activate the "MAINTENANCE" switch 4 times in a row.

- Hold the « MANUAL RESET » button, located on the controller inspection board, for 2.5 seconds. This action reset the controller if every conditions are good and clear the alarms.

Note: for more details see appendix C.

13.1.3. Automatic fault list erasing:

If a fault occurred and the situation has been corrected, after a certain number of rides, the controller will automatically erase the fault list. DM275 contains the number of rides before the fault list will be clear. So, if DM275 equal 50, the fault list will be clear after every 50 rides made by the elevator. In le LCD, the fault list will be cleared, but the fault history will not and will still hold the last 20 registered alarms. Only “ENTER” key in the "FAULT HISTORY" menu of the LCD can allow to clear fault history.

13.1.4. Motor drive alarms and faults access:

See section 7.2.4 or 8.2.6 of this document.

See the drive manual for more details.

13.1.5. « UCM », « NTSD » and « ETSD » processors fault list access:

« UCM », « NTSD » and « ETSD » processors keeps in there memory faults that occured since the last time somebody clears the faults. The faults codes can be shown on the processor blinking outputs or with the LCD in the controller. Refer to the drawing to see the blinking legend.

Faults are saved in the holding memory registers « H ». Faults will not be lost on a lost of power. To clear faults use the LCD.

Use the LCD, follow those steps :

Disconnect the LCD cable from the main processor and connect it to the NTSD or ETSD processor as shown by sections 9.1.8.2 and 9.2.6.2.

- Press « ESC » key.
- Press « UP/DOWN » key in the main menu and select « ALARMS & CPU I/O CHECKING ».
- Press « ENTER » key.
- Press « UP/DOWN » key up to « ACTIVE FAULTS LIST » menu.
- Press « ENTER » key.

Note: To clear the fault list, press « ENTER » and confirm to clear.

13.1.5.1. « UCM » processor faults for contract speed elevators 150FPM or less :

Fault codes indicator using "UCM" processor outputs :

When a fault is detected by the processor, outputs 04, and 05 of the "UCM" processor will blink. The table bellow list fault codes.

Blinking fault codes	Binary code	
Faults	**Output 04**	**Output 05**
UCM relay deactivated. (unintended car movement detected)	ON	OFF
Processor memory battery as to be replaced.	OFF	ON
No fault	OFF	OFF

Use the LCD to access « UCM » processor faults :

Faults # :	**Description :**	**Causes et verifications :**
HR8.09	Unintended car movement detected (UCM)	The «UCM» processor detected unintended car movement by using: DZO, DZO1, LU and LD sensors signals. Doors opened or closed in inspection, if the elevator looses DZO and DZO1 sensors when stopped at a floor, the UCM relay will release the emergency brake. Be carefull if you disconnect the tape selector supply in the door zone and LU or LD sensors are activated, that will generate that fault. Verify the brake operation when the elevator is stopped.
HR8.15	Processor memory battery as to be replaced.	Verify if the red LED on the processor is blinking. If so, you will have to replace CJ1W-BAT01 battery, see section 13.2.

13.1.5.2. « NTSD » processor faults for contract speed elevators 200 FPM :

Fault codes indicator using "NTSD" processor outputs :

When a fault is detected by the processor, outputs 03, 04, and 05 of the "NTSD" processor will blink. The table bellow list fault codes.

Blinking fault codes				Binary code
Faults	**Output 03**	**Output 04**	**Output 05**	
NTSD independent positionning feedback signal lost.	ON	ON	ON	7
UCM relay deactivated. (unintended car movement detected)	ON	ON	OFF	6
Elevator speed exceeds 150 FPM in inspection.	ON	OFF	ON	5
Processor memory battery as to be replaced.	ON	OFF	OFF	4
UDCR relay contact stuck.	OFF	ON	ON	3
N/A	OFF	ON	OFF	2
LRH/LRB activated at the same time.	OFF	OFF	ON	1
No fault	OFF	OFF	OFF	0

Use the LCD to access « NTSD » processor faults :

Faults # :	**Description :**	**Causes et verifications :**
HR800	Spare	
HR801	Independent positionning feedback signal lost	Refer to the drawings to indentify the independent positionning feedback used. If 2 proximities mounted on the tape selector head : Verify HT1B and HT2B inputs on the « NTSD » processor. Those inputs must blink when the elevator is moving. The maximum detection distance is 5 mm. Verify if the proximity is not to far from the perforated tape. If perforated tape used as independant feedback : Verify HT1B and HT2B inputs on the « NTSD » processor. Those inputs must blink when the elevator is moving. Verify the mirror and clean it if dirty. Clean holes of the perforated tape.

Faults # :	**Description :**	**Causes et verifications :**
		If gouvernor encoder : Verify HT1B and HT2B inputs on the « NTSD » processor. Those inputs must blink when the elevator is moving. Verify encoder cable connection. Verify encoder mounting to be sure the encoder sleeve is weel tight on the governor shaft.
HR802	The elevator speed exceeds 150 FPM in inspection mode.	The elevator speed exceeds 150 FPM in inspection mode. Verify the drive inspection speed parameter. Verify the speed shown on the LCD when connected on the «NTSD» processor. If too high compared with a hand tachometer, the conversion factor will have to be changed.
HR803	Spare	
HR804	Spare	
HR805	LRH / LRB limits activated at the same time.	Verify the mechanical operation of both switches specialy at the landing where the fault occured. At top landing, verify LRB signal, it must be activated. The processor input must be activated. At bottom landing, verify LRH signal, it must be activated. The processor input must be activated.
HR806	Spare	
HR807	UDCR signal stays activated when the elevator is stopped.	Verify UDCR relay operation. This relay should not stay activated when the elevator is stopped. Verify UDCR processor input. The input should be OFF when the elevator is stopped.
HR808	Spare	
HR809	Unintended car movement detected (UCM)	The «NTSD» processor detected unintended car movement using : perforated tape, governor encoder ou 2 proximities mounted on the tape selector head when the elevator was stopped (HT1B and HT2B). Verify the brake operation when the elevator is stopped. Verify if electrical noise can affect HT1B and HT2B signals.
HR810	Spare	
HR811	Spare	
HR812	Spare	
HR813	Spare	
HR814	Spare	
HR815	Processor memory battery as to be replaced.	Verify if the red LED ALR on the processor is blinking. If so, you will have to replace CJ1W-BAT01 battery, see section 13.2

13.1.5.3. « NTSD » processor faults for contract speed elevators greater than 200 FPM :

Fault codes indicator using "NTSD" processor outputs :

When a fault is detected by the processor, outputs 03, 04, and 05 of the "NTSD" processor will blink. The table bellow list fault codes.

Blinking fault codes				Binary code
Faults	**Output 03**	**Output 04**	**Output 05**	
NTSD independent positionning feedback signal lost.	ON	OFF	ON	5
Processor memory battery as to be replaced.	ON	OFF	OFF	4
HSD signal from motor drive activated when elevator stopped.	OFF	ON	ON	3
LRH1/LRB1 activated at the same time.	OFF	ON	OFF	2
LRH/LRB activated at the same time.	OFF	OFF	ON	1
No fault	OFF	OFF	OFF	0

Use the LCD to access « NTSD » processor faults :

Faults #:	**Description:**	**Causes et verifications**
HR800	Spare	
HR801	Spare	
HR802	Spare	
HR803	HSD signal lost.	The elevator did 5 stops at terminal landings without seeing the HSD (high speed) signal coming from the motor drive. This signal should activate when the elevator speed is arround 75% of contract speed. This signal must deactivate when the elevator is stopped. Verify the input light on the processor. Be sure the drive has the parameter properly adjusted.
HR804	LRH1 / LRB1 limits activated at the same time.	Verify the mechanical operation of both switches specialy at the landing where the fault occured. At top landing, verify LRB1 signal, it must be activated. The processor input must be activated. At bottom landing, verify LRH1 signal, it must be activated. The processor input must be activated.
HR805	LRH / LRB limits activated at the same time.	Verify the mechanical operation of both switches specialy at the landing where the fault occured. At top landing, verify LRB signal, it must be activated. The processor input must be activated.

Faults #:	**Description:**	**Causes et verifications**
		At bottom landing, verify LRH signal, it must be activated. The processor input must be activated.
HR806	HSD signal stays activated when the elevator is stopped.	Verify the drive output HSD signal. This signal should activate when the elevator speed is arround 75% of contract speed. This signal must deactivate when the elevator is stopped.
HR807	Spare	
HR808	Spare	
HR809	Spare	
HR810	Spare	
HR811	Spare	
HR812	Spare	
HR813	Spare	
HR814	Spare	
HR815	Processor memory battery as to be replaced.	Verify if the red LED ALR on the processor is blinking. If so, you will have to replace CJ1W-BAT01 battery, see section 13.2

13.1.5.4. « ETSD » processor faults for contract speed elevators greater than 200 FPM :

Fault codes indicator using "ETSD" processor outputs :

When a fault is detected by the processor, outputs 03, 04, and 05 of the "ETSD" processor will blink. The table bellow list fault codes.

Blinking fault codes				**Binary code**
Faults	**Output 03**	**Output 04**	**Output 05**	
ETSD independent positionning feedback signal lost.	ON	ON	ON	7
ETSD relay deactivated. (unintended car movement detected)	ON	ON	OFF	6
Elevator speed exceeds 150 FPM in inspection.	ON	OFF	ON	5
Processor memory battery as to be replaced.	ON	OFF	OFF	4
UDCR relay contact stuck.	OFF	ON	ON	3
Not used	OFF	ON	OFF	2
Emergency stop occured with SLH / SLB.	OFF	OFF	ON	1

No fault	OFF	OFF	OFF	0

Use the LCD to access « ETSD » processor faults :

Faults #:	**Description:**	**Causes et verifications**
HR800	Spare	
HR801	Independent positionning feedback signal lost	Refer to the drawings to indentify the independent positionning feedback used. If 2 proximities mounted on the tape selector head : Verify HT1B and HT2B inputs on the « ETSD » processor. Those inputs must blink when the elevator is moving. The maximum detection distance is 5 mm. Verify if the proximity is not to far from the perforated tape. If perforated tape used as independant feedback : Verify HT1B and HT2B inputs on the « ETSD » processor. Those inputs must blink when the elevator is moving. Verify the mirror and clean it if dirty. Clean holes of the perforated tape. If gouvernor encoder : Verify HT1B and HT2B inputs on the « ETSD » processor. Those inputs must blink when the elevator is moving. Verify encoder cable connection. Verify encoder mounting to be sure the encoder sleeve is weel tight on the governor shaft.
HR802	The elevator speed exceeds 150 FPM in inspection mode.	The elevator speed exceeds 150 FPM in inspection mode. Verify the drive inspection speed parameter. Verify the speed shown on the LCD when connected on the «ETSD» processor. If too high compared with a hand tachometer, the conversion factor will have to be changed.
HR803	SLB emergency terminal stopping limit fault	When the elevator activates SLB limit at bottom landing, the elevator speed was higher than the threshold programmed in register DM0205. Increase the threshold if needed. Verify the captured speed in register DM0300 of «ETSD» processor. This is the captured speed when the fault occurred. Make the elevator stopping at bottom landing several

Faults #:	Description:	Causes et verifications
		times. Verify register DM0310 of «ETSD» processor. This value shows the actual speed when the SLB limit is activated. Verify the SLB limit operation. Verify elevator speed, accel and decel curves and readjust if needed. Verify normal position feedback operation and independent feedback also for governor encoder, or perforated tape.
HR804	Spare	
HR805	SLH emergency terminal stopping limit fault	When the elevator activates SLH limit at top landing, the elevator speed was higher than the threshold programmed in register DM0206. Increase the threshold if needed. Verify the captured speed in register DM0304 of «ETSD» processor. This is the captured speed when the fault occurred. Make the elevator stopping at top landing several times. Verify register DM0314 of «ETSD» processor. This value shows the actual speed when the SLH limit is activated. Verify the SLH limit operation. Verify elevator speed, accel and decel curves and readjust if needed. Verify normal position feedback operation and independent feedback also for governor encoder, or perforated tape.
HR806	Spare	
HR807	UDCR signal stays activated when the elevator is stopped.	Verify UDCR relay operation. This relay should not stay activated when the elevator is stopped. Verify UDCR processor input. The input should be OFF when the elevator is stopped.
HR808	Spare	
HR809	Unintended car movement detected (UCM)	The «ETSD» processor detected unintended car movement using : perforated tape, governor encoder ou 2 proximities mounted on the tape selector head when the elevator was stopped (HT1B and HT2B). Verify the brake operation when the elevator is stopped. Verify if electrical noise can affect HT1B and HT2B signals.
HR810	Spare	
HR811	Spare	
HR812	Spare	
HR813	Spare	
HR814	Spare	
HR815	Processor memory battery as to be	Verify if the red LED ALR on the processor is blinking.

Faults #:	Description:	Causes et verifications
	replaced.	If so, you will have to replace CJ1W-BAT01 battery, see section 13.2

13.2. PLC battery replacement:

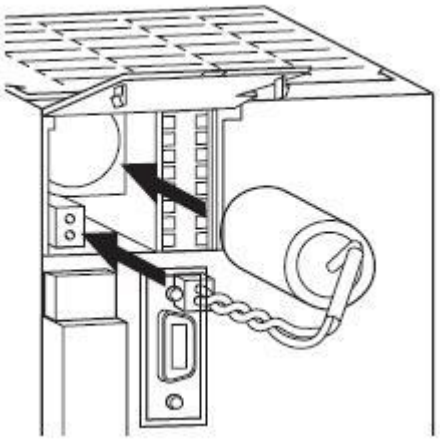
The battery lifetime is approximately five years. If the voltage level becomes too low, the ALARM indicator on the PLC will flash and the car will be turned "out of order". Then, you must replace the battery within one week. Replacement dates of the battery are indicated on the CPU front cover. The catalogue number for the battery is CJ1W-BAT01.

WARNING

When replacing the battery, you must proceed quickly (within 5 minutes), or else, you will loose the PLC program.

Follow these steps to replace the battery:

- Turn off the main power.
- Open the cover above the peripheral port on the CPU. You should now see the battery.



- Pull out the battery and unplug its connector.
- Quickly put the new battery in place and plug the connector.
- Turn the main power on.
- Though it is not mandatory, you should erase the "low battery" message in the CPU. However, you have to do it if a "low battery" alarm is active.

- Connect the hand held programmer;
- Type in the password CLR-MONTR-CLR;
- The screen will display "low batt";
- Type in CLR-FUN-MONTR-MONTR.

- Make sure that POWER and RUN indicators on the CPU are on. Then you may turn the elevator back in service.

13.3. Input/Output modules:

Output module (CJ1W-OC211):

Output modules are provided with 2AMP rated not removable relays. Those relays may become defective after some hundreds of thousands of operations or if their contacts are overloaded.

Output module (CJ1W-OD231):

The PLC output module includes 100ma 24VDC optocouplers.

Output problems:

- If the red output led is "ON" but there is no voltage on the corresponding terminal; the relay or the optocouplers may be in trouble. Replace the module.

- If the red output led is "OFF" but there is a voltage on the corresponding terminal, the relay contact may be "soldered". Replace the module.

Relay positioning in the CJ1W-OC211 module:

SORTIE	RELAIS
0	X101
1	X102
2	X103
…	…
14	X115
15	X116

Input module (CJ1W-ID212, 24VDC, CJ1W-ID231, CJ1W-ID261 or CJ1W-IA111, 120VAC):

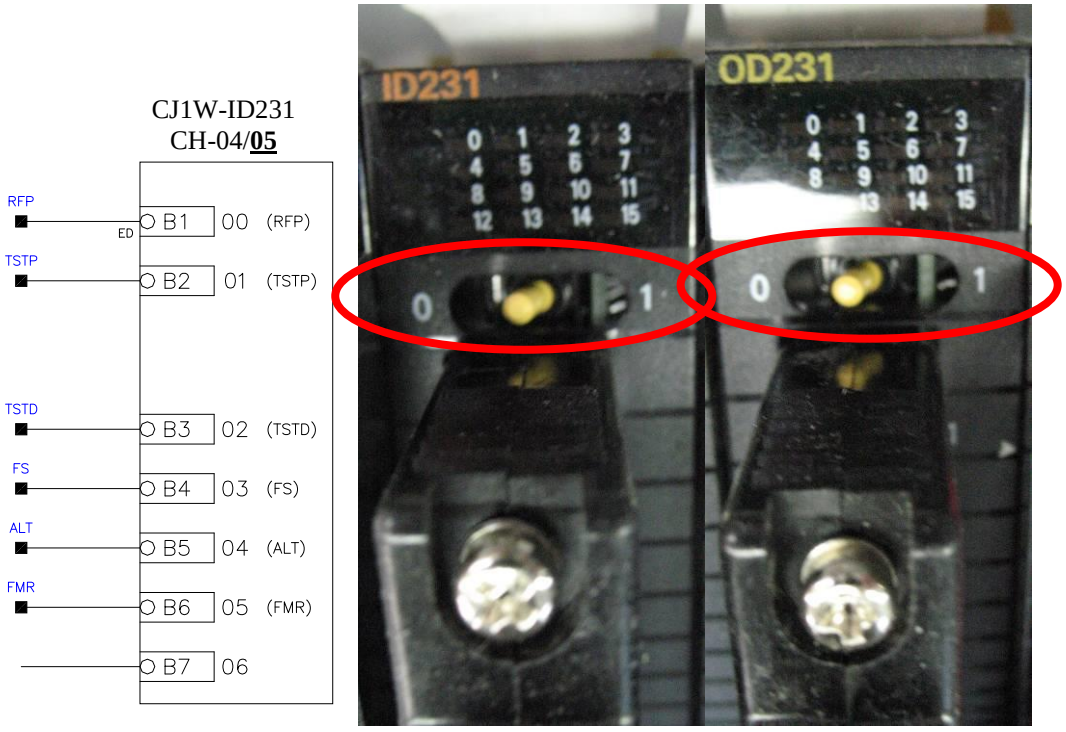
- The controller is provided with 16 points, 32 points or 64 points at 24VDC or 16 points 120VAC input module. This type of input module is built with optocouplers able to withstand millions of operations. However, an excessive input voltage level may damage those inputs.

13.3.1. Reading inputs and outputs on modules of more than 16 inputs or outputs:

On the modules CJ1W-ID261 (64 inputs), CJ1W-ID231 (32 inputs) and CJ1W-OD231 (32 outputs), the inputs and outputs status are not all displayed at the same time.

CJ1W-ID231 and CJ1W-OD231:

For the 32 points modules (CJ1W-ID231 and CJ1W-OD231) a small yellow switch located over the connectors allows alternating between the first 16 points and the last 16. If the switch is on the left (0), the module displays the first 16 points and if it's on the right (1), the 16 lasts. On the electrical drawings of the controller, the underlined number indicates the selected module. For example, if the numbers are **04**/05, you must put the switch on the left (0) to see the inputs state and if 04/**05** is written on the input or output module to visualize, put the switch to the right (1).

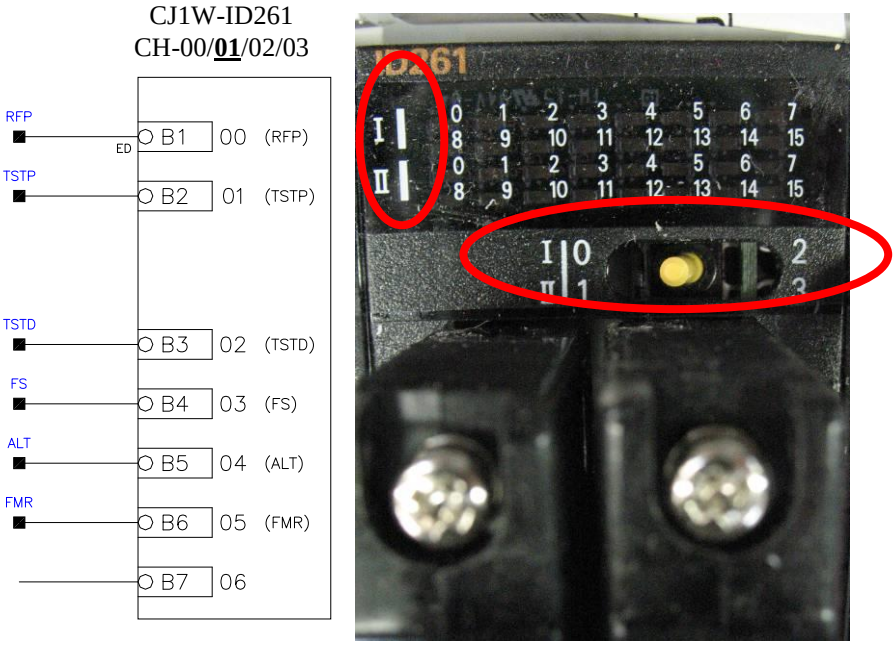


For example, to visualize the input, you must verify the "DEL2" on the ID231 module with the switch on the right (1).

CJ1W-ID261:

For the 64 points modules (CJ1W-ID261) a small yellow switch located over the connectors allows alternating between the first 32 points and the last 32. If the switch is on the left (0), the module displays the first 32 points on 2 series of DEL and if it's on the right, (1) the last 32. On the electrical drawings of the controller, the underlined number indicates the selected module. For example, if the modules numbers are 00/**01**/02/03, you must put the switch on the left (0) and look at the

second row (II) of DEL. To see the inputs state is 00/01/**02**/03 is written on the module to visualize, put the switch on the right (1) and look at the first series of DEL (I). So, if we want to visualize the inputs of module 02, you must put the switch on the right (1) and look at the first 16 DEL (16 the top of row 1 (I)).



For example, to visualize the input TSTD, you must check the "DEL2" of the second row (II) of the module ID261 with the switch on the left (0).

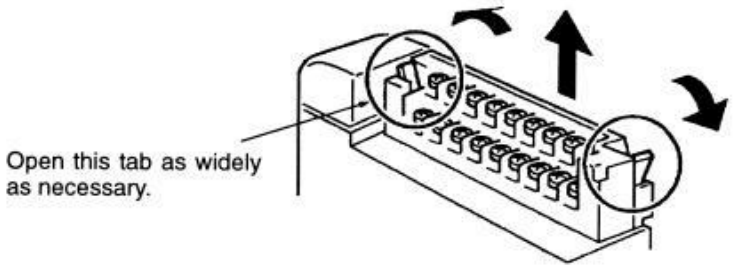
Input problems:

- If there is some voltage on input but the corresponding red input led is "OFF"; the optocoupler may be in trouble. Replace the module.

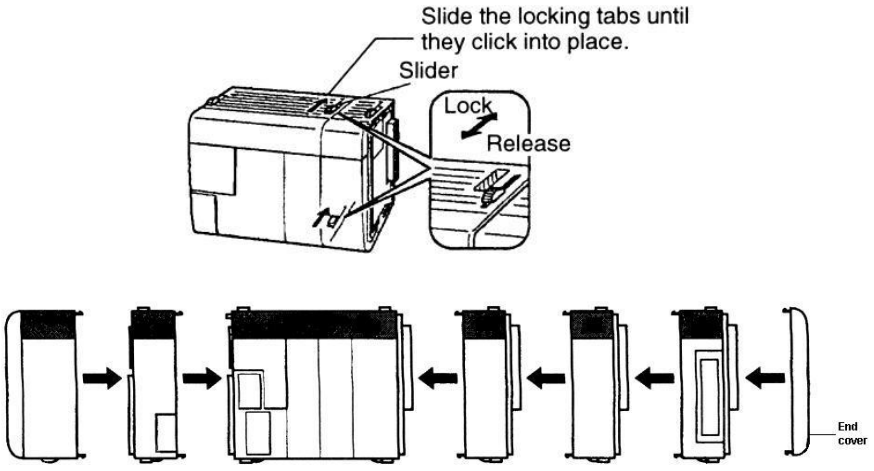
Module replacement:

Always turn off the power before removing or putting in a module in the PLC.

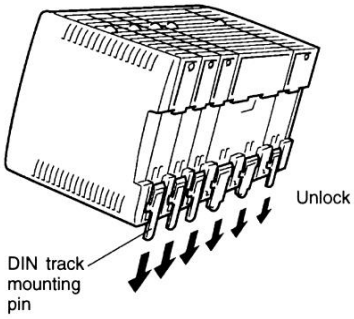
- Remove the terminal block.



- Push back the yellow sliding locks on the top and bottom of each module towards the mounting plate as indicated in the figure below. Slide the modules to the right, to free the one to be replaced



- Release the holding clips at the bottom of the module



- Take the defective module off the rail by releasing the holding clip at the bottom of the module.

- Put in the new module at the same location and go back through the previous steps.

Make sure the right end cover is back in place, or the PLC will not work properly.

<u>Re-assignment of an I/O as an emergency solution:</u>

If you have to replace an I/O point, and you do not have a spare one, program the troubled output on a spare output, but only if it shares the same voltage.

Bring your programming tool in the machine room and call us. To be able to change the program, you need a password. We will tell you what to do for the I/O address modification

13.4. Peak voltage protection:

Please note a wrong connection could short-circuit the "TVS" (transient voltage suppressor) that protects the elevator. If it occurs, they must be verified and replaced if needed.

To verify them, use an ohmmeter and place the sensors on the "TVS" terminals. If the value shown is 0, the "TVS" is short-circuited.

13.5. Alarms description:

Alarms #:	Description:	Causes and verifications
HR8000	Regeneration module fault	Refer to the manufacturer's manual to access the alarms list. Check the RRDY signal's status, it should be activated.
HR8001	The PLC controller battery alarm	See section 14.2 of user's manual for the PLC battery replacement.
HR8002	Excessive travel time.	The elevator has exceeded the DM0008 or DM0017 delay during the travel. Verify: the elevator commute, the LRH/LRB slowdown limits and the drive speed control circuit board.
HR8003	Phase lost/inverse detection.	Verify the phase detection relay "RPR".
HR8004	Weight sensor "**LW2**" was activated.	Verify the weight load device that activated the LW2 input.
HR8005	Over temperature motor sensor detection "**THM**"	Verify the state of the thermal sensor that activated the THM input.
HR8006	Deactivation of the rope gripper contacts in the safety line.	Verify the rope gripper contacts between RG5 and RG7. They opened the safety line. For more details, see the electrical drawings.
HR8007	One of the 2 door zone sensors "**DZO**" and "**DZO1**" remained activated out of the levelling zone.	Verify the tape head. One of the sensors remained activated.
HR8008	"**DZO**" and "**DZO1**" door zone sensor did not operate properly in levelling zone.	Verify the tape head. One of the sensors did not activate.
HR8009	The temperature sensor has detected an overheating in the resistor box.	Reset by pressing on the temperature sensor's red button which is located in the top of the panel if the controller is made with a manual reset sensor and a "DBR" relay. If the resistor becomes red, cut the power and contact Automatisation JRT inc. If not, move the elevator in contract speed and make sure the resistor does not become red. If the contactor doesn't activate, check the temperature sensor or the contactor. If this fault occurs occasionally, slightly move away the temperature sensor located in the resistor box from the braking

Alarms #:	**Description:**	**Causes and verifications**
		resistor. Reset by pressing for 1 second on the JRT-INT's "Manual Reset" button if the controller is made with an automatic reset sensor and a "MDI" contactor. If the resistor becomes red, cut the power and contact Automatisation JRT inc. If not, move the elevator in contract speed and make sure the resistor does not become red. If the contactor doesn't activate, check the temperature sensor or the contactor. If this fault occurs occasionally, slightly move away the temperature sensor located in the resistor box from the braking resistor.
HR8010	"**LU**" Levelling Up sensor did not operate properly in levelling zone.	Verify the relay and sensor operation in the top of car reader connecting box.
HR8011	"**LD**" Levelling Down sensor did not operate properly in levelling zone.	Verify the relay and sensor operation in the top of car reader connecting box.
HR8012	**DCL** switch did not open when **front** door closed.	Verify DCL switch operation. The switch did not open before the DM0032 delay, when front door closed, with PP and PC switches closed.
HR8013	**DCL** did not close when **front** door opened.	Verify DCL switch operation. The switch did not close when the front door opened, with DOL switch opened, PC and PP switches closed. The DCL switch opened more than a half second while the front door was completely opened.
HR8014	**DOL** switch did not open when **front** door opened.	Verify DOL switch operation. The switch did not open when the front door is completely opened, or the door did not completely open after 12 seconds on door opening instruction when DCL switch and OP relay are closed.
HR8015	**DOL** switch did not close when **front** door closed.	Verify DOL switch operation. The switch did not close when the front door closed, with DCL switch opened and PP closed.

Alarms #:	Description:	Causes and verifications
HR8100	**RDCL** switch did not open when **rear** door closed.	Verify RDCL switch operation. The switch did not open before DM0032 delay when rear door is closing, with PC and PP switches closed.
HR8101	**RDCL** switch did not close when **rear** door opened.	Verify RDCL switch operation. The switch did not close when rear door opened, RDOL switches opened, PC and PP switches closed. The RDCL switch opened more than a half second while the rear door was completely opened.
HR8102	**RDOL** switch did not open when **rear** door opened.	Verify RDOL switch operation. The switch did not open when rear door opened or the door did not fully open after 12 seconds on door opening instruction when RDCL switch and ROP relay are closed.
HR8103	**RDOL** switch did not close when **rear** door closed	Verify RDOL switch operation. The switch did not close when rear door closed, with RDCL switches opened and PP closed.
HR8104	**PP** landing doors contact did not close when doors closed.	Verify PP landing doors contact. The contact did not close when door was fully closed, after 20 seconds, DCL and RDCL opened, CL and RCL relays activated. Verify DCL and RDCL switches operations.
HR8105	**PC** car doors contact did not close when doors closed	Verify PC car doors contact. The contact did not close when door was fully closed, after 20 seconds, DCL and RDCL opened, CL and RCL relays activated. Verify DCL and RDCL switches operations.
HR8106	**PC** or **PP** contacts did not open when doors opened.	Verify PC and PP operation. PC and PP contacts did not open when doors opened, DCL and RDCL switches opened. Verify if either contact is short-circuited and DCL and RDCL switches operation. This fault can occur if those switches are not opened when PP and PC are fully closed.
HR8107	**Front** door did not close completely after 5 attempts.	Verify doorway. Something might be blocking. Check PP and PC contacts operation. Also check DCL switch operation.

Alarms #:	**Description:**	**Causes and verifications**
HR8108	**Rear** door did not close completely after 5 attempts.	Verify doorway. Something might be blocking. Check PP and PC contacts operation. Also check RDCL switch operation.
HR8109	Water detection in the hoistway	Water in the hoistway or verify the float switch.
HR8110	**ETSD** relay tripped. Speed redundancy.	Refer to section 13.1.5 about alarm codes for redundancy processor.
HR8111	**J9** security line was opened**.**	J9 security line opened while the elevator was moving or 4 seconds after it had stopped. Verify security line switches (see drawings for more details).
HR8112	Variable speed drive fault.	Refer to section 14.1.5 to access alarms list. Verify RDY signal condition, as it should be activated.
HR8113	**M** contactor failure.	Verify M contactor and M1 relay operation when opening and closing. Verify M and M1 processor input contacts operation.
HR8114	Spare	
HR8115	Perforated tape reader malfunction.	The processor receives too many or not enough pulses from the perforated tape. Verify HT1 and HT2 indicators operation on the processor (they should be flashing when elevator is moving). Clean both infrared transmitters and the hoistway mirror.
HR8200	Relay PR doesn't activate	Verify the LNH/LNB/UCA/DCA/GTS/DZO/DZO1/ PC/PP circuit which supplies relays PR and UDC. One of the circuit's contact doesn't close properly and input PR doesn't activate.
HR8201	**UDC** relay failure.	Verify UDC relay operation when opening and closing. Verify circuit operation on UDC processor input.
HR8202	**MA** relay failure.	Verify MA relay operation when opening and closing. Verify MA circuit operation on MA processor input.
HR8203	The elevator slides in the brake pads after floor stop.	The elevator has moved +/- 6 inches when stopped at a floor. Verify brake springs adjustment.
HR8204	Uncontrolled elevator speed (CVI).	The elevator speed was over 150 FPM in the levelling zone or in inspection mode. The perforated tape or the encoder counter may be loosing counts.

Alarms #:	Description:	Causes and verifications
HR8205	**SR** security line supervision was lost.	SR security line opened while the elevator was moving or 4 seconds after it had stopped. Verify security line switches (see drawings for more details).
HR8206	**MO/DRIVE MOTOR ON** did not come on at a start command.	Verify the MA transistor output. Make sure the drive receives the start command.
HR8207	Rope gripper activation by programmable PLC.	Verify if PP and PC opened outside the DZO. The car re-levelled at a floor more than 5 times within 60 seconds. Verify, if needed, the mechanical brake switch. The car traveled more than 6 inches, without command, while it was stopped at a landing.
HR8208	The elevator moved in the wrong direction.	Verify drive "% No load current, Inertia" adjustments and gains. Check if the drive can maintain the load. Check M contactor operation.
HR8209	Car door contact **PC** relay opened during movement out of door zone.	Verify PC contacts operation and clean them.
HR8210	Hall door contact **PP** relay opened during movement out of door zone.	Verify PP contacts operation and clean them. This can occur when mechanics open the hall doors with a lunar key, while the elevator is moving.
HR8211	Brake malfunction at opening or closing.	It takes too much time for the brake to activate or it does not open. Check the mechanical brake operation. Also check brake springs adjustments.
HR8212	The actual speed does not follow the internal reference from the variable speed drive (Speed deviation low).	Verify the motor encoder rotation direction versus the motor's. Verify the motor adjustment parameters.
HR8213	Excessive re-levelling attempts at the same floor.	Verify levelling speed PS1 in the drive. Verify mechanical brake closing operation.
HR8214	The PLC does not receive the uncontrolled speed signal (**CVI**) (150 FPM).	Verify cable connection on **JRT-OVS-GL1** PC board **CVI** terminal (Elevators at 200 FPM only). The yellow LED should always be light and the red LED should light up each time the elevator moves in automatic mode. (section 10) (for 200 FPM elev). Verify the CV1 led on the CJ1M processor, the CVI led should light up each time the elevators moves in automatic mode (section 10).

Alarms #:	**Description:**	**Causes and verifications**
HR8215	The batteries of the emergency brake release unit need to be replaced.	Every week the controller will start and test the power pack to be sure of its condition. That test sequence can be done during the day. The controller will start the power pack and cycle 5 times 3 seconds pulse with a 4 amps current at 120 VAC. If for any reason the power is found to be non-operationnal, the controller will stop the elevator and an error code will appear. Also the bottom car call light will flash. The manual reset button resets the alarm. The elevator can restart up to the next test period, so you have one week to fix the problem. See appendix G for more details.
HR8300	**LRH/1** and **LRB/1** top and bottom slowdown limit were activated at the same time.	Verify electrical wiring and physical contacts.
HR8301	**LRB1** bottom slow down limit did not operate properly.	Verify electrical wiring and physical contacts.
HR8302	**LRH1** top slow down limit did not operate properly.	Verify electrical wiring and physical contacts.
HR8303	**LRB** bottom slow down limit did not operate properly.	Verify electrical wiring and physical contacts.
HR8304	**LRH** top slow down limit did not operate properly.	Verify electrical wiring and physical contacts.
HR8305		
HR8306		
HR8307		
HR8308	**SLB** bottom emergency speed limiting device did not operate properly.	Verify electrical wiring and physical contacts.
HR8309	**SLH** top emergency speed limiting device did not operate properly.	Verify electrical wiring and physical contacts.
HR8310	**LNB** down normal limit switch failure.	Verify electrical wiring and limit switch contact.
HR8311	**LNH** up normal limit switch failure.	Verify electrical wiring and limit switch contact.

Alarms #:	**Description:**	**Causes and verifications**
HR8312	Motor overload detected by the drive **Motor overload**.	Verify the motor's electrical connexion and its voltage (D2 parameter, motor current, inside the drive). Make sure no mechanical trouble prevents the car from moving.
HR8313	Earthquake Service	Verify the state of the inputs "Seismic switch" and "Counterweigh derailment switch" and reset the sequence with the button "Reset earthquake service".
HR8314	Wrong LRB adjustment.	The limit is too far from the deceleration point. The DM360 is even to the holes difference between the deceleration point and the slowdown limit. Reajust consequently.
HR8315	Wrong LRH adjustment.	The limit is too far from the deceleration point. The DM364 is even to the holes difference between the deceleration point and the slowdown limit. Reajust consequently.
HR8400	Wrong LRB1 adjustment.	The limit is too far from the deceleration point. The DM362 is even to the holes difference between the deceleration point and the slowdown limit. Reajust consequently.
HR8401	Spare	
HR8402	Spare	
HR8403	Spare	
HR8404	Spare	
HR8405	Wrong LRH1 adjustment.	The limit is too far from the deceleration point. The DM366 is even to the holes difference between the deceleration point and the slowdown limit. Reajust consequently.

Alarms #:	Description:	Causes and verifications
HR8406	Spare	
HR8407	Spare	
HR8408	Spare	
HR8409	Spare	
HR8410	Spare	
HR8411	Corrupted data	PLC's data are corrupted. Defective PLC or data loss.
HR8412	Spare	
HR8413	The emergency brake does not open proprely.	The emergency brake does not pick up according the emergency brake contact (EBRC). Check the mechanical brake and the brake switch operation..
H8414	Traction loss detected.	The controller detected a position difference between the main positioning system (motor's encoder) and the secondary positioning system (perforated tape or governor's encoder). Check the encoders and their cables. Clean the two infrared emitter's tape and the elevator shaft mirror. Verify that the sheave's cables are not sliding.
HR8415	Spare	

Note: HR85-86-87 are redundancy faults, R5 and ETSL.

HR8500	**DZO** relay did not activate.	Verify DZO relay operation, because it did not activate when the PLC DZO input activated.
HR8501	**DZO** relay contacts remained closed.	Verify DZO relay operation, because it remained closed when the PLC DZO input deactivated
HR8502	**DZO1** relay did not activate	Verify DZO1 relay operation, because it did not activate when the PLC DZO1 input activated.
HR8503	**DZO1** relay contacts remained closed.	Verify DZO1 relay operation, because it remained closed when the PLC DZO1 input deactivated
HR8504	Spare	
HR8505	Spare	
HR8506	**LU** and **LD** levelling sensors were activated at the same time.	Verify LU and LD inputs operation. Verify the sensor operation in the top of car reader connecting box
HR8507	**ISR** relay did not activate.	Verify ISR relay operation, because it did not activate when the PLC ISR input activated

Alarms #:	Description:	Causes and verifications
HR8508	**ISR** relay has remained closed.	Verify ISR relay operation, because it remained closed when the PLC ISR input deactivated
HR8509	**PP** relay did not activate.	Verify PP relay operation, because it did not activate when the PLC PP input activated
HR8510	**PP** relay has remained closed.	Verify PP relay operation, because it remained closed when the PLC PP input deactivated
HR8511	**PC** relay did not activate.	Verify PC relay operation, because it did not activate when the PLC PC input activated
HR8512	**PC** relay has remained closed.	Verify PC relay operation, because it remained closed when the PLC DZO input deactivated
HR8513	**BAC** relay did not activate.	Verify BAC relay operation, because it did not activate when the PLC BAC input activated
HR8514	**BAC** relay has remained closed.	Verify BAC relay operation, because it remained closed when the PLC BAC input deactivated
HR8515	**UCM** relay contacts remained closed.	Verify the UCM relay operation because the UCM processor signal was deactivated and the relay contact remained closed.
HR8600	**ETSD** relay did not activate.	Verify ETSD relay operation, because it did not activate when the PLC ETSD input activated
HR8601	**ETSD** relay has remained closed.	Verify ETSD relay operation, because it remained closed when the PLC ETSD input deactivated
HR8602	**UCM** relay did not activate.	Verify UCM relay operation, because it did not activate when UCM processor input was activated.
HR8603	**XIN** relay did not activate.	Verify XIN relay operation, because it did not activate when the PLC XIN input activated
HR8604	**XIN** relay has remained closed.	Verify XIN relay operation, because it remained closed when the PLC XIN input deactivated
HR8605	**R5** relay did not activate.	Verify R5 relay operation, because it did not activate when the PLC R5 input activated
HR8606	**R5** relay has remained closed.	Verify R5 relay operation, because it remained closed when the PLC R5 input deactivated
HR8607	**RCR** relay did not activate.	Verify RCR relay operation, because it did not activate when the PLC RCR input activated

Alarms #:	Description:	Causes and verifications
HR8608	**RCR** relay has remained closed	Verify RCR relay operation, because it remained closed when the PLC RCR input deactivated
HR8609	**PR** relay did not activate.	Verify PR relay operation, because it did not activate when the PLC PR input activated
HR8610	**PR** relay has remained closed.	Verify PR relay operation, because it remained closed when the PLC PR input deactivated
HR8611	**HDL** relay did not activate.	Verify HDL relay operation, because it did not activate when the PLC HDL input activated
HR8612	**HDL** relay has remained closed.	Verify HDL relay operation, because it remained closed when the PLC HDL input deactivated
HR8613	24 Volts DC **+A** power failure.	Verify protection fuse. The filament could be defective. There may have been a short-circuit.
HR8614	The governor's reset remained closed.	Check the governor's reset coil proper functioning and the PLC input monitoring the reset.
HR8615	**NTSD** relay has remained closed.	Verify NTSD relay operation, because the NTSD processor input was deactivated and the relay contact remained closed.
HR8700	Spare	
HR8701	Spare	
HR8702	**GTS** relay did not activate.	Verify GTS relay operation, because it did not activate when the PLC GTS input activated
HR8703	**GTS** relay has remained closed.	Verify GTS relay operation, because it remained closed when the PLC GTS input deactivated
HR8704	**PPM** relay did not activate.	Verify PPM relay operation, because it did not activate when the PLC PPM input activated
HR8705	**PPM** relay has remained closed.	Verify PPM relay operation, because it remained closed when the PLC PPM input deactivated
HR8706	SR input or PR input on the UCM processor (150FPM or less)	The main processor detects a stuck ON inputs (SR or PR) while moving from UCM processor. The ISRM signal from the UCM processor remained closed or did not activate. When the elevator is stopped, at least PR relay or SR safety circuit input should activate de corresponding input on the UCM processor (

Alarms #:	Description:	Causes and verifications
		150FPM or less).
HR8707	EBR contactors contacts remained closed.	Check EBR contactor proper functioning for it remained closed upon EBR input deactivated.
HR8708	The brake pulse switch remained closed.	Check SW20 switch proper functioning for it remained closed when the SW10 switch (allowing brake pulse) wasn't activated.
HR8709	DDZO signal missing after 4 rides. (UCM processor 150FPM or less)	The main processor did not receive leveling sensor signals from the UCM processor. Verify DZO, DZO1, LU and LD signals connected on the UCM processor. If one of those signals is missing or stuck ON after 4 elevator rides, the fault will be generated.
HR8710	Spare	
HR8711	Spare	
HR8712	Spare	
HR8713	Spare	
HR8714	**UP/DW** relay did not activate.	Verify UP/DW relay operation, because it did not activate when the PLC UP/DW input activated
HR8715	**UP/DW** relay has remained closed.	Verify UP/DW relay operation, because it remained closed when the PLC UP/DW input deactivated
HR8800	Communication lost with the JRT-CAN-MAS	Verify connections, supply and switches configuration. (See CANBUS manual)
HR8801	Communication lost with the JRT-CAN-HCI	Verify connections, supply and switches configuration. (See CANBUS manual)
HR8802	Communication lost with the Car B duplex	Verify connections, supply and switches configuration. (See CANBUS manual)
HR8803	Communication lost with the module 0 JRT-CAN-24IO	Verify connections, supply and switches configuration. (See CANBUS manual)
HR8804	Communication lost with the module 1 JRT-CAN-24IO	Verify connections, supply and switches configuration. (See CANBUS manual)
HR8805	Communication lost with the module 2 JRT-CAN-24IO	Verify connections, supply and switches configuration. (See CANBUS manual)
HR8806	Communication lost with the module 3 JRT-CAN-24IO	Verify connections, supply and switches configuration. (See CANBUS manual)

Alarms #:	**Description:**	**Causes and verifications**
HR8807	Dupline network was opened	Verify connections, supply and switches configuration. (See CANBUS manual)
HR8808	Spare	
HR8809	Spare	
HR8810	NTSD relay did not activate	Verify NTSD relay operation, because it did not come on when the NTSD processor input was activated.
HR8811	NTSD relay fault	See fault list section 9.1.8.
HR8812	Light curtain fault.	For a vertical sliding door freight elevator, the photocell proper functioning must be checked before closing the door. Check the photocell proper functioning.
HR8813	**HSD** signal lost	The elevator did 5 stops at top or bottom landing without receiving the HSD high speed signal from the drive. Verify the HSD input on the NTSD processor when the elevator runs at contract speed. Verify the HSD drive output parameter.
HR8814	NTSD processor slowdown signal lost at top or bottom landing.	Verify the **NTSS** signal from **NTSD** processor. This signal must deactivate when LRH / LRB limits opens at terminal landings.
HR8815	Door jammed on opening	The elevator tried to completely open the door 3 times without succeeding. The alarm activates once an opening relay (FOP, ROP) is activated lasting more than the protection delay. Ensure the door operators are supplied. Check the door opening.

Note: The HR85-86-87 channels deactivate the R5 or ETSD relay.

14. DRIVE PARAMETERS MENU:

14.1. HPV900 DRIVE OVERALL MENU:

DISPLAY D0	ADJUST A0
Elevator Data D1 • Speed Command • Speed Reference • Speed Feedback • Speed Error • Pre-Torque Ref • Spd Reg Torq Cmd • Tach Rate Cmd • Aux Torque Cmd • Est Inertia • Logic Inputs • Logic Outputs ***Power Data D2*** • Torque Reference • Motor Current • % Motor Current • Motor Voltage • Motor Frequency • Motor Torque • Power Output • DC Bus Voltage • Flux Reference • Flux Output • Slip Frequency • Motor Overload • Drive Overload • Flux Current • Torque Current • Flux Voltage • Torque Voltage • Base Impedance • Est No Load Curr • Est Rated RPM	***Drive A1*** • Contract Car Spd • Contract Mtr Spd • Response • Inertia • Inner Loop Xover • Gain Reduce Mult • Gain Chng Level • Tach Rate Gain • Spd Phase Margin • Ramped Stop Time • Contact Flt Time • Brake Pick Time • Brake Hold Time • Overspeed Level • Overspeed Time • Overspeed Mult • Encoder Pulses • Spd Dev Lo Level • Spd Dev Time • Spd Dev Hi Level • Spd Command Bias • Spd Command Mult • Pre Torque Bias • Pre Torque Mult • Zero Speed Level • Zero Speed Time • Up/Dwn Threshold • Mtr Torque Limit • Regen Torq Limit • Flux Wkn Factor • Ana Out 1 Offset • Ana Out 2 Offset • Ana Out 1 Gain • Ana Out 2 Gain • Flt Reset Delay • Flt Resets/Hour • Up To Spd. Leve
	S-Curves A2 • Accel Rate 0 • Decel Rate 0 • Jerk Rate 0 • Lev Jerk Rate 0 • Accel Rate 1 • Decel Rate 1 • Jerk Rate 1 • Lev Jerk Rate 1 • Accel Rate 2 • Decel Rate 2 • Jerk Rate 2 • Lev Jerk Rate 2 • Accel Rate 3 • Decel Rate 3 • Jerk Rate 3 • Lev Jerk Rate 3
	Multi-Step Ref A3 • Speed Command 1 • Speed Command 2 • Speed Command 3 • Speed Command 4 • Speed Command 5 • Speed Command 6 • Speed Command 7 • Speed Command 8 • Speed Command 9 • Speed Command 10 • Speed Command 11 • Speed Command 12 • Speed Command 13 • Speed Command 14 • Speed Command 15
	Power Convert A4 • Id Reg Diff Gain • Id Reg Prop Gain • Iq Reg Diff Gain • Iq Reg Prop Gain • PWM Frequency • UV Alarm Level • UV Fault Level • Extern Reactance • Input L-L Volts
	Motor A5 • Motor Id • Rated Mtr Pwr • Rated Mtr Volts • Rated Excit Freq • Rated Motor Curr • Motor Poles • Rated Mtr Speed • % No Load Curr • Stator Leakage X • Rotor Leakage X • Stator Resist • Motor Iron Loss • Motor Mech Loss • Ovld Start Level • Ovld Time Out • Flux Sat Break • Flux Sat Slope 1 • Flux Sat Slope 2

CONFIGURE C0	UTILITY U0	FAULTS F0
User Switches C1 • Spd Command Src • Run Command Src • Hi/Lo Gain Src • Speed Reg Type • Motor Rotation • Spd Ref Release • Cont Confirm Src • Pre Torque Source • Pre Torque Latch • Ptorq Latch Clck • Fault Reset Src • Overspd Test Src • Brake Pick Src • Brake Pick Cnfm • Brake Hold Src • Ramped Stop Sel • Ramp Down En Src • Brk Pick Flt Ena • Brk Hold Flt Ena • Dir Confirm • S-curve Abort	***Password U1*** • New Password • Enter Password • Password Lockout	***Active Faults F1*** • Display Active Faults • Reset Active Faults
	Hidden Items U2 • Hidden Items Enable	***Fault History F2*** • Display Fault History • Clear Fault History
	Units U3 • Units Selection	
Logic Inputs C2 • Log In 1 tb1-1 • Log In 2 tb1-2 • Log In 3 tb1-3 • Log In 4 tb1-4 • Log In 5 tb1-5 • Log In 6 tb1-6 • Log In 7 tb1-7 • Log In 8 tb1-8 • Log In 9 tb1-9	***Ovrspeed Test U4*** • Overspeed Test?	
	Restore Dflts U5 • Restore Motor Defaults • Restore Drive Defaults	
Logic Outputs C3 • Log Out 1 tb1-14 • Log Out 2 tb1-15 • Log Out 3 tb1-16 • Log Out 4 tb1-17 • Relay Coil 1 • Relay Coil 2	***Drive Info U6*** • Drive Version • Boot Version • Cube ID	
Analog Outputs C4 • Ana Out 1 tb1-33 • Ana Out 2 tb1-35	***Hex Monitor U7*** • Adress	

14.2. HPV900 DETAILLED MENU:

ADJUST A0 MENU → DRIVE A1

FNCT. #	DESCRIPTION	UNIT	DEFAULT	SITE SETTING
CONTRACT CAR SPD	Elevator contract speed	m/s or FPM		
CONTRACT MTR SPD	Motor speed at elevator contract speed	RPM		
RESPONSE	Sensitivity of the speed regulator	rad/sec	10.0	
INERTIA	System inertia	sec	1.2	
INNER LOOP XOVER	Inner speed loop crossover frequency (only with Ereg speed regulator)	rad/sec	2.0	
GAIN REDUCE MULT	Percentage of response of the speed regulator using when in the low gain mode	%	70	
GAIN CHNG LEVEL	Speed level to change to low gain mode (only with internal gain switch)	% rated speed	7.0	
TACH RATE GAIN	Helps with the effects of rope resonance	%	0.0	
SPD PHASE MARGIN	Sets phase margin of speed regulator (only with PI speed regulator)	degrees	80	
RAMPED STOP TIME	Time to ramp torque from rated torque to zero (only with torque ramp down function)	seconds	0.2	
CONTACT FLT TIME	Time before a contactor fault is declared	seconds	0.5	
BRAKE PICK TIME	Time before a brake pick fault is declared	seconds	1.00	
BRAKE HOLD TIME	Time before a brake hold fault is declared	seconds	0.20	
OVERSPEED LEVEL	Threshold for detection of overspeed fault	% contract spd	115	
OVERSPEED TIME	Time before a overspeed fault is declared	seconds	0.80	
OVERSPEED MULT	Multiplier for overspeed test	%	100	
ENCODER PULSES	Encoder counts per revolution	None	1024	
SPD DEV LO LEVEL	Range around the speed reference for speed deviation low logic output	% contract spd	20.0	
SPD DEV TIME	Time before speed deviation low logic output si true	Seconds	0.90	
SPD DEV HI LEVEL	Level for declaring speed deviation alarm	% contract spd	35.0	
SPD COMMAND BIAS	Subtracts an effective voltage to actual speed command voltage	Volts	0.00	
SPD COMMAND MULT	Scales analog speed command	None	1.00	
PRE TORQUE BIAS	Subtracts an effective voltage to actual pre toque command voltage	Volts	1.00	
PRE TORQUE MULT	Scales pre-torque command	None	1.5	
ZERO SPEED LEVEL	Threshold for zero speed logic output	% contract spd	1.00	
ZERO SPEED TIME	Time before zero speed logic output is declared true	seconds	0.20	
UP/DWN THRESHOLD	Threshold for detection of up or down direction	% contract spd	1.00	
MTR TORQUE LIMIT	Motoring torque limit	% rated torque	250.0	
REGEN TORQ LIMIT	Regenerating torque limit	% rated torque	250.0	
FLUX WKN FACTOR	Defines the torque limit at higher speeds	% torque	70	
ANA OUT 1 OFFSET	Subtracts an effective voltage to actual analog output 1	%	0.00	
ANA OUT 2 OFFSET	Subtracts an effective voltage to actual analog output 2	%	0.00	
ANA OUT 1 GAIN	Scaling factor for analog output 1	None	1.0	
ANA OUT 2 GAIN	Scaling factor for analog output 2	None	1.0	
FLT RESET DELAY	Time before a fault is automatically reset	Seconds	5	
FLT RESETS/HOUR	Number of faults that is allowed to be automatically reset per hour	Faults	3	
UP TO SPD LEVEL	Threshold for up to spd logic output	% cont spd	80.0	

ADJUST A0 MENU → S-CURVE A2

FNCT. #	DESCRIPTION	UNIT	DEFAULT	SITE SETTING
ACCEL RATE 0	Acceleration rate limit	ft/s2 or m/s2	2.20	
DECEL RATE 0	Deceleration rate limit	ft/s2 or m/s2	2.20	
ACCEL JERK IN 0	Rate of increase of acceleration, up to ACCEL RATE, when increasing elevator speed	ft/s3 or m/s3	8.00	
ACCEL JERK OUT 0	Rate of decrease of acceleration to zero when approaching contract elevator speed	ft/s3 or m/s3	8.00	
DECEL JERK IN 0	Rate of increase of deceleration, up to DECEL RATE, when decreasing elevator speed	ft/s3 or m/s3	8.00	
DECEL JERK OUT 0	Rate of decrease of deceleration to zero when slowing the elevator to levelling speed	ft/s3 or m/s3	8.00	
ACCEL RATE 1	Acceleration rate limit	ft/s2 or m/s2	0.30	
DECEL RATE 1	Deceleration rate limit	ft/s2 or m/s2	2.00	
ACCEL JERK IN 1	Rate of increase of acceleration, up to ACCEL RATE, when increasing elevator speed	ft/s3 or m/s3	8.00	
ACCEL JERK OUT 1	Rate of decrease of acceleration to zero when approaching contract elevator speed	ft/s3 or m/s3	8.00	
DECEL JERK IN 1	Rate of increase of deceleration, up to DECEL RATE, when decreasing elevator speed	ft/s3 or m/s3	8.00	
DECEL JERK OUT 1	Rate of decrease of deceleration to zero when slowing the elevator to levelling speed	ft/s3 or m/s3	8.00	
ACCEL RATE 2	Acceleration rate limit	ft/s2 or m/s2	2.20	
DECEL RATE 2	Deceleration rate limit	ft/s2 or m/s2	2.20	
ACCEL JERK IN 2	Rate of increase of acceleration, up to ACCEL RATE, when increasing elevator speed	ft/s3 or m/s3	8.00	
ACCEL JERK OUT 2	Rate of decrease of acceleration to zero when approaching contract elevator speed	ft/s3 or m/s3	8.00	
DECEL JERK IN 2	Rate of increase of deceleration, up to DECEL RATE, when decreasing elevator speed	ft/s3 or m/s3	8.00	
DECEL JERK OUT 2	Rate of decrease of deceleration to zero when slowing the elevator to levelling speed	ft/s3 or m/s3	8.00	
ACCEL RATE 3	Acceleration rate limit	ft/s2 or m/s2	3.00	
DECEL RATE 3	Deceleration rate limit	ft/s2 or m/s2	3.00	
ACCEL JERK IN 3	Rate of increase of acceleration, up to ACCEL RATE, when increasing elevator speed	ft/s3 or m/s3	8.00	
ACCEL JERK OUT 3	Rate of decrease of acceleration to zero when approaching contract elevator speed	ft/s3 or m/s3	8.00	
DECEL JERK IN 3	Rate of increase of deceleration, up to DECEL RATE, when decreasing elevator speed	ft/s3 or m/s3	8.00	
DECEL JERK OUT 3	Rate of decrease of deceleration to zero when slowing the elevator to levelling speed	ft/s3 or m/s3	8.00	

ADJUST A0 MENU → MULTI-STEP A3

FNCT. #	DESCRIPTION	UNIT	DEFAULT	SITE SETTING
SPEED COMMAND 1	Multi-step speed command #1	FPM OR M/SEC	7	
SPEED COMMAND 2	Multi-step speed command #2	FPM OR M/SEC	30	

FNCT. #	DESCRIPTION	UNIT	DEFAULT	SITE SETTING
SPEED COMMAND 3	Multi-step speed command #3	FPM OR M/SEC	60	
SPEED COMMAND 4	Multi-step speed command #4	FPM OR M/SEC	0	
SPEED COMMAND 5	Multi-step speed command #5	FPM OR M/SEC	1 floor run speed	
SPEED COMMAND 6	Multi-step speed command #6	FPM OR M/SEC	Contract speed	
SPEED COMMAND 7	Multi-step speed command #7	FPM OR M/SEC	0	
SPEED COMMAND 8	Multi-step speed command #8	FPM OR M/SEC	0	
SPEED COMMAND 9	Multi-step speed command #9	FPM OR M/SEC	0	
SPEED COMMAND 10	Multi-step speed command #10	FPM OR M/SEC	0	
SPEED COMMAND 11	Multi-step speed command #11	FPM OR M/SEC	0	
SPEED COMMAND 12	Multi-step speed command #12	FPM OR M/SEC	0	
SPEED COMMAND 13	Multi-step speed command #13	FPM OR M/SEC	0	
SPEED COMMAND 14	Multi-step speed command #14	FPM OR M/SEC	0	
SPEED COMMAND 15	Multi-step speed command #15	FPM OR M/SEC	0	

ADJUST A0 MENU → POWER CONVERT A4

FNCT. #	DESCRIPTION	UNIT	DEFAULT	SITE SETTING
Id REG DIFF GAIN	Flux current regulator differential gain	None	1.00	
Id REG PROP GAIN	Flux current regulator proportional gain	None	0.30	
Iq REG DIFF GAIN	Torque current regulator differential gain	None	1.00	
Iq REG PROP GAIN	Torque current regulator proportional gain	None	0.30	
PWM FREQUENCY	Carrier frequency	khz	10.0	
UV ALARM LEVEL	Voltage level for undervoltage alarm	% nominal bus	80	
UV FAULT LEVEL	Voltage level for undervoltage fault	% nominal bus	70	
EXTERN REACTANCE	External choke reactance	% base z	0.0	
INPUT L-L VOLTS	Nominal line-line AC input Voltage, RMS	Volts	460 OR 230	

ADJUST A0 MENU → MOTOR A5

FNCT. #	DESCRIPTION	UNIT	DEFAULT	SITE SETTING
MOTOR ID	Motor identification	None		
RATED MTR POWER	Rated motor output power	HP/KW		
RATED MTR VOLTS	Rated motor terminal RMS voltage	Volts		
RATED EXCIT FREQ	Rated excitation frequency	Hz		
RATED MOTOR CURR	Rated motor current	Amps		
MOTOR POLES	Motor poles	None		
RATED MTR SPEED	Rated motor speed at full load	RPM		

FNCT. #	DESCRIPTION	UNIT	DEFAULT	SITE SETTING
% NO LOAD CURR	Percent no load current	% rated motor	Per ID	
STATOR LEAKAGE X	Stator leakage reactance	% base z	Per ID	
ROTOR LEAKAGE X	Rotor leakage reactance	% base z	Per ID	
STATOR RESIST	Stator resistance	% base z	Per ID	
MOTOR IRON LOSS	Iron loss at rated frequency	% rated power	Per ID	
MOTOR MECH LOSS	Mechanical loss at rated frequency	% rated power	Per ID	
OVLD START LEVEL	Maximum continuous motor current	% rated power	Per ID	
OVLD TIME OUT	Time that defines motor overload curve	Seconds	Per ID	
FLUX SAT BREAK	Flux saturation curve slope change point	% flux	Per ID	
FLUX SAT SLOPE 1	Flux saturation curve slope for low fluxes	PU slope	Per ID	
FLUX SAT SLOPE 2	Flux saturation curve slope for high fluxes	PU slope	Per ID	

CONFIGURE C0 MENU → USER SWITCHES C1

FNCT. #	DESCRIPTION	DEFAULT	CHOICES	SITE SETTING
SPD COMMAND SRC	Speed Command Source	MULTI-STEP	analog input multi-step serial ser mult step	
RUN COMMAND SRC	Run Command Source	EXTERNAL TB	external tb serial serial+extrn	
HI/LO GAIN SRC	High / Low gain change switch source	INTERNAL	external tb serial internal	
SPEED REG TYPE	Chooses speed regulator: Ereg or Pi regulator	ELEV SPD REG	elev spd reg pi speed reg external reg	
MOTOR ROTATION	Allows user to reverse direction of motor rotation	FORWARD	forward reverse	
SPD REF RELEASE	Determines when speed reference release is asserted	REG RELEASE	reg release brake picked	
CONT CONFIRM SRC	Determines if an external logic input is used for contactor confirm	NONE	none external tb	
PRETORQUE SOURCE	Determines if a pre torque command is used and if used, it determines the source of the pre torque command	ANALOG INPUT	none analog input serial	
PRETORQUE LATCH	Chooses if analog pre torque command is latched	NOT LATCHED	latched not latched	
PTORQ LATCH CLCK	Determines source of pre torque latch control (if used)	NONE	none external tb1	
FAULT RESET SRC	Fault reset source	EXTERNAL TB	external tb serial automatic	
OVERSPD TEST SRC	Determines external logic source to trigger overspeed test	EXTERNAL TB	external tb serial	
BRAKE PICK SRC	If drive controls the mechanical brake, this determines the source of the brake pick command	INTERNAL	Internal serial	
BRAKE PICK CNFM	Determines if a logic input is used for brake pick confirm	NONE	none external tb	
BRAKE HOLD SRC	If drive controls the mechanical brake, this determines the source of the brake hold command	INTERNAL	internal serial	

FNCT. #	DESCRIPTION	DEFAULT	CHOICES	SITE SETTING
RAMPED STOP SEL	Chooses between normal stop and torque ramp down stop	NONE	none ramp on stop	
RAMP DOWN EN SRC	Determines the source that signals the torque ramp down stop	EXTERNAL TB	external tb run logic serial	
BRK PICK FLT ENA	Brake pick fault enable	DISABLE	disable enable	
BRK HOLD FLT ENA	Brake hold fault enable	DISABLE	disable enable	
EX TORQ CMD SRC	Sets source of external torque command	NONE	none serial	
DIR CONFIRM	Allows confirmation of polarity of analog speed command	DISABLED	disabled enabled	
S-CURVE ABORT	Addresses handling of a speed command change before S-Curve target speed	ENABLED	disabled enabled	

CONFIGURE C0 MENU → LOGIC INPUTS C2

FNCT. #	DESCRIPTION	UNIT	DEFAULT	SITE SETTING
LOG IN 1 TB1-1	Logic input configuration for Tb1-1		DRIVE ENABLE	
LOG IN 2 TB1-2	Logic input configuration for Tb1-2		S-CURVE SEL 1	
LOG IN 3 TB1-3	Logic input configuration for Tb1-3		RUN UP	
LOG IN 4 TB1-4	Logic input configuration for Tb1-4		UP/DWN	
LOG IN 5 TB1-5	Logic input configuration for Tb1-5		S-CURVE SEL 0	
LOG IN 6 TB1-6	Logic input configuration for Tb1-6		STEP REF B0	
LOG IN 7 TB1-7	Logic input configuration for Tb1-7		STEP REF B1	
LOG IN 8 TB1-8	Logic input configuration for Tb1-8		STEP REF B2	
LOG IN 9 TB1-9	Logic input configuration for Tb1-9		FAULT RESET	

Choice	
CONTACT CFIRM	Auxiliary contacts from motor contactor
DRIVE ENABLE	Must be asserted to permit drive to run. This does not initiate run, just permits initiation.
EXTRN FAULT 1	User input fault #1
EXTRN FAULT 2	User input fault #2
EXTRN FAULT 3	User input fault #3
FAULT RESET	Asserting this input attempts to reset faults
LOW GAIN SEL	Low gain for the speed regulator is chosen when this input is asserted
MECH BRAKE HOLD	Auxiliary contacts from mechanical brake. Asserted when brake is in hold mode.
MECH BRAKE PICK	Auxiliary contacts from mechanical brake. Asserted when brake is picked (lifted).
NO FUNCTION	Input not assigned
OSPD TEST SRC	Asserting input, applies the overspeed multiplier to the speed command for the next run
PRE-TRQ LATCH	Transition from false to true latches pre torque command
RUN	If drive is enabled through the DRIVE ENABLE logic input, this function will start drive operation.
RUN DOWN	If drive is enabled trough the DRIVE ENABLE logic input, this function will start drive operation with negative speed commands.
RUN UP	If drive is enabled through the DRIVE ENABLE logic input, this function will start drive operation with positive speed commands.
S-CURVE SEL 0	Bit 0 of S-curve selection
S-CURVE SEL 1	Bit 1 of S-curve selection

FNCT. #	DESCRIPTION	UNIT	DEFAULT	SITE SETTING
STEP REF B0	Bit 0 of multi-step speed command selection			
STEP REF B1	Bit 1 of multi-step speed command selection			
STEP REF B2	Bit 2 of multi-step speed command selection			
STEP REF B3	Bit 3 of multi-step speed command selection			
TRQ RAMP DOWN	Asserting this ramps torque output to zero at "Ramped Stop Time parameter" rate.			
UP/DWN	This logic can be used to change the sign of the speed command. (false=no inversion, true=inverted)			

CONFIGURE C0 MENU → LOGIC OUTPUTS C3

FNCT. #	DESCRIPTION	UNIT	DEFAULT	SITE SETTING
LOG OUT 1 TB1-14	Logic output configuration for Tb1-14		MOTOR OVERLOAD	
LOG OUT 1 TB1-15	Logic output configuration for Tb1-15		RUN CONFIRM	
LOG OUT 1 TB1-16	Logic output configuration for Tb1-16		NO FUNCTION	
LOG OUT 1 TB1-17	Logic output configuration for Tb1-17		NO FUNCTION	
RELAY COIL 1	Relay output configuration for relay 1		SPEED DEV LOW	
RELAY COIL 2	Relay output configuration for relay 2		READY TO RUN	
Choices				
ALARM	An alarm declared by the drive			
ALARM+FLT	A fault or alarm is declared by the drive			
BRAKE ALARM	A brake fault is declared while the drive is running			
BRAKE HOLD	The brake pick confirmation is received			
BRAKE PICK	Signal used to pick (open) the mechanical brake			
BRK HOLD FLT	Brake hold state has not matched the commanded state			
BRK IGBT FLT	Brake IGBT has reached overcurrent			
BRK PICK FLT	Brake pick state has not matched the commanded state			
CAR GOING DWN	The motor is moving in negative direction faster than user specified speed			
CAR GOING UP	The motor is moving in positive direction faster than user specified speed			
CHARGE FAULT	DC bus has not charged			
CLOSE CONTACT	The drive has been enabled & commanded to run and no faults are present			
CONTACTOR FLT	Contactor state has not matched the commanded state			
CURR REG FLT	The actual current measurement does not match commanded current			
DRV OVERLOAD	The drive has exceeded the drive overload curve			
ENCODER FLT	Encoder is disconnected or not functioning, while attempting to run			
FAN ALARM	Cooling fan failure			
FAULT	A fault declared by the drive			
FLUX CONFIRM	The drive's estimate of flux has reached 90% of reference			
FUSE FAULT	DC bus fuse is open			
GROUND FAULT	Sum of all phase currents exceeds 50% of rated current			
IN LOW GAIN	Low gain or response is now being used by the speed regulator			
MOTOR TRQ LIM	The drive has exceeded the motoring torque limit			
MTR OVERLOAD	The motor has exceeded the motor overload curve			
NO FUNCTION	Output not assigned			
NOT ALARM	The output is true when an alarm is NOT present			
OVER CURR FLT	Phase current exceeded 300%			
OVERSPEED FLT	The drive has exceeded the overspeed level			
OVERTEMPS FLT	Heatsink temperature exceeded 105°C (221°F)			

FNCT. #	DESCRIPTION	UNIT	DEFAULT	SITE SETTING
OVERVOLT FLT	DC bus voltage exceeded 850VDC for 460V drive or 425 VDC for 230V drive			
OVRTEMP ALARM	Heatsink temperature exceeded 90°C (194°F)			
PHASE FAULT	Open motor phase			
RAMPT DOWN ENA	Indicates the torque is ramping to zero			
READY TO RUN	The drive's software has initialized and no faults are present			
REGEN TRQ LIM	The drive has exceeded the regenerating torque limit			
RUN COMMANDED	The drive is being commanded to run			
RUN CONFIRM	The drive has been enabled & commanded to run; no faults are present; the contactor has closed; and the IGBTs are firing			
SPEED DEV	The speed feedback is failing to properly track the speed reference			
SPEED DEV LOW	The speed feedback is properly tracking the speed reference			
SPEED REF RLS	Flux is confirmed and brake is picked (if used)			
SPEED REG RLS	Flux is confirmed and brake is commanded to be picked (if used)			
UNDERVOLT FLT	DC bus voltage has dropped below a specified percent			
UP TO SPEED	The motor speed is above a user defined level			
UV ALARM	DC bus voltage has dropped below a specified percent			
ZERO SPEED	The motor speed below user defined level			

CONFIGURE C0 MENU → ANALOG OUTPUTS C4

FNCT. #	DESCRIPTION	UNIT	DEFAULT	SITE SETTING
ANA OUT 1 TB1-33	Analog output channel #1 configuration		SPEED REF	
ANA OUT 2 TB1-35	Analog output channel #2 configuration		speed FEEDBK	
Choices				
AUX TORQ CMD	Additional torque command from auxiliary source			
BUS VOLTAGE	Measured DC bus voltage			
CURRENT OUT	Percent motor current			
DRV OVERLOAD	Percent of drive overload trip level reached			
FLUX CURRENT	Measured flux producing current			
FLUX OUTPUT	Measured flux output			
FLUX REF	Flux reference used by vector control			
FLUX VOLTAGE	Flux producing voltage			
FREQUENCY OUT	Electrical frequency			
MTR OVERLOAD	Percent of motor overload trip level reached			
POWER OUTPUT	Calculated power output			
PRE TORQUE REF	Pre-torque reference			
SLIP FREQ	Commanded slip frequency			
SPD RG TQ CMD	Torque command from speed regulator			
SPEED COMMAND	Speed command before S-Curve			
SPEED ERROR	Speed reference minus speed feedback			
SPEED FEEDBK	Speed feedback used by speed regulator			
SPEED REF	Speed reference after S-Curve			
TACH RATE CMD	Torque command from tach rate gain function			
TORQ CURRENT	Measured torque producing current			
TORQ VOLTAGE	Torque producing voltage			
TORQUE OUTPUT	Calculated torque output			
TORQUE REF	Torque reference used by vector control			
VOLTAGE OUT	RMS motor terminal voltage			

DISPLAY D0 MENU → ELEVATOR DATA D1

FNCT. #	DESCRIPTION	UNIT	DEFAULT	SITE SETTING
SPEED COMMAND	Speed command before speed reference generator	fpm or m/s		
SPEED REFERENCE	Speed reference after speed reference generator	fpm or m/s		
SPEED FEEDBACK	Encoder feedback used by speed regulator	fpm or m/s		
SPEED ERROR	Speed reference minus speed feedback	fpm or m/s		
PRE-TORQUE REF	Pre-torque reference	% RATED TORQUE		
SPD REG TORQ CMD	Torque command from speed regulator	% RATED TORQUE		
TACH RATE CMD	Torque command after tach rate gain function	% RATED TORQUE		
AUX TORQUE CMD	Feedforward torque command from auxiliary source	% RATED TORQUE		
EST INERTIA	Estimated elevator system inertia	SECONDS		
LOGIC OUTPUTS	Shows condition of logic outputs	1=T 0=F		
LOGIC INPUTS	Shows condition of logic inputs	1=T 0=F		

DISPLAY D0 MENU → POWER DATA D2

FNCT. #	DESCRIPTION	UNIT	DEFAULT	SITE SETTING
TORQUE REFERENCE	Torque reference used by vector control	% rated torque		
MOTOR CURRENT	RMS motor current	Amps		
% MOTOR CURRENT	Percent motor current	% rated current		
MOTOR VOLTAGE	RMS motor terminal voltage	Volts		
MOTOR FREQUENCY	Electrical frequency output	Hz		
MOTOR TORQUE	Calculated motor torque output	% rated torque		
POWER OUTPUT	Calculated drive power output	KW		
DC BUS VOLTAGE	Measured DC bus voltage	Vplts		
FLUX REFERENCE	Flux reference used by vector control	% rated flux		
FLUX OUTPUT	Measured flux output	% rated flux		
SLIP FREQUENCY	Commanded slip frequency	Hz		
MOTOR OVERLOAD	Percent of motor overload trip level reached	%		
DRIVE OVERLOAD	Percent of drive overload trip level reached	%		
FLUX CURRENT	Measured flux producing current	% rated current		
TORQUE CURRENT	Measured torque producing current	% rated current		
FLUX VOLTAGE	Flux voltage reference	% rated volts		
TORQUE VOLTAGE	Torque voltage reference	% rated volts		
BASE IMPEDANCE	Drive calculated base impedance	Ohms		
EST NO LOAD CURR	Estimated no load current	% rated current		
EST RATED RPM	Estimated rated RPM	RPM		

UTILITY U0 MENU → PASSWORD U1

FNCT. #	DESCRIPTION	CHOICES	DEFAULT	SITE SETTING
ENTER PASSWORD	Allows the user to enter in a password		012345	
NEW PASSWORD	Used to change the established password			
PASSWORD LOCKOUT	Used to enable and disable password lockout	disabled enabled	DISABLED	

UTILITY U0 MENU → HIDDEN ITEMS U2

FNCT. #	DESCRIPTION	CHOICES	DEFAULT	SITE SETTING
HIDDEN ITEMS	Selects if the "hidden" parameters will be displayed on the Digital Operator	disabled enabled	ENABLED	

UTILITY U0 MENU → UNITS U3

FNCT. #	DESCRIPTION	CHOICES	DEFAULT	SITE SETTING
UNITS	Choose either metric units or standard English measurements units		ENGLISH	

UTILITY U0 MENU → OVERSPEED TEST U4

FNCT. #	DESCRIPTION	CHOICES	DEFAULT	SITE SETTING
OVERSPEED TEST	Allows for Overspeed Test to be enabled via the digital operator	no yes	NO	

UTILITY U0 MENU → RESTORE DEFAULTS U5

FNCT. #	DESCRIPTION	CHOICES	DEFAULT	SITE SETTING
DRIVE DEFAUTLS	Resets all parameters to there default values except parameters in MOTOR A5			
MOTOR DEFAULTS	Resets the parameters in the MOTOR A5 to the defaults defined b the MOTOR ID			

UTILITY U0 MENU → DRIVE INFO U6

FNCT. #	DESCRIPTION	CHOICES	DEFAULT	SITE SETTING
DRIVE VERSION	Shows the software version of the drive software			
BOOT VERSION	Shows the lower level software version of the drive			
CUBE ID	Displays the cube identification number of the drive			

FAULT F0 MENU → ACTIVE FAULTS F1

FNCT. #	DESCRIPTION	UNIT	DEFAULT	SITE SETTING
DISPLAY ACTIVE FAULTS	Contains a list of up to the last sixteen faults			
RESET ACTIVE FAULTS	Allows for reset of active faults			

FAULT F0 MENU → FAULT HISTORY F2

FNCT. #	DESCRIPTION	UNIT	DEFAULT	SITE SETTING
DISPLAY FAULT HISTORY	Contains a list of up to the last sixteen faults			
CLEAR FAULT HISTORY	Allows for the clearing of the fault history			

15. DRIVE PARAMETERS MENU:

15.1. HPV600 DRIVE OVERALL MENU:

Display D0	Adjust A0		
Elevator Data D1	***Drive A1***		
• Speed Command • Speed Reference • Speed Feedback • Speed Error • Pre-Torque Ref • Spd Reg Torq Cmd • Tach Rate Cmd • Aux Torque Cmd • Est Inertia • Rx Com Status • Logic Inputs • Logic Outputs	• Contract Car Spd • Contract Mtr Spd • Response • Inertia • Inner Loop Xover • Gain Reduce Mult • Gain Chng Level • Tach Rate Gain • Spd Phase Margin • Ramped Stop Time • Contact Flt Time • Brake Pick Time • Brake Hold Time • Overspeed Level • Overspeed Time • Overspeed Mult • Encoder Pulses • Spd Dev Lo Level	• Spd Dev Time • Spd Dev Hi Level • Spd Command Bias • Spd Command Mult • Pre Torque Bias • Pre Torque Mult • Zero Speed Level • Zero Speed Time • Up/Dwn Threshold • Mtr Torque Limit • Regen Torq Limit • Flux Wkn Factor • Ana Out 1 Offset • Ana Out 2 Offset • Ana Out 1 Gain • Ana Out 2 Gain • Flt Reset Delay • Flt Resets/Hour	• Up To Spd. Level • Mains Dip Speed • Run Delay Timer • Ab Zero Spd Lev • Ab Off Delay • Contactor Do Dly • Trq Lim Msg Dly • Ser2 Insp Spd • Ser2 Rs Crp Spd • Ser2 Rs Crp Time • Ser2 Flt Tol • Rollback Gain • Notch Filter Frq • Notch Filt Depth • Mspd Delay 1 • Mspd Delay 2 • Mspd Delay3 • Mspd Delay 4
Power Data D2 • Torque Reference • Motor Current • % Motor Current • Motor Voltage • Motor Frequency • Motor Torque • Power Output • DC Bus Voltage • Flux Reference • Flux Output • Slip Frequency • Motor Overload • Drive Overload • Flux Current • Torque Current • Flux Voltage • Torque Voltage • Base Impedance • Est No Load Curr • Est Rated RPM	***S-Curves A2***		
	• Accel Rate 0 • Decel Rate 0 • Accel Jerk In 0 • Accel Jerk Out 0 • Decel Jerk In 0 • Decel Jerk Out 0 • Accel Rate 1 • Decel Rate 1	• Accel Jerk In 1 • Accel Jerk Out 1 • Decel Jerk In 1 • Decel Jerk Out 1 • Accel Rate 2 • Decel Rate 2 • Accel Jerk In 2 • Accel Jerk Out 2	• Decel Jerk In 2 • Decel Jerk Out 2 • Accel Rate 3 • Decel Rate 3 • Accel Jerk In 3 • Accel Jerk Out 3 • Decel Jerk In 3 • Decel Jerk Out 3
	Multi-step Ref A3		
	• Speed Command 1 • Speed Command 2 • Speed Command 3 • Speed Command 4 • Speed Command 5	• Speed Command 6 • Speed Command 7 • Speed Command 8 • Speed Command 9 • Speed Command 10	• Speed Command 11 • Speed Command 12 • Speed Command 13 • Speed Command 14 • Speed Command 15
	Power Convert A4		
	• Id Reg Diff Gain • Id Reg Prop Gain • Iq Reg Diff Gain	• Iq Reg Prop Gain • PWM Frequency • UV Alarm Level	• UV Fault Level • Extern Reactance • Input L-L Volts

Motor A5

- Motor Id
- Rated Mtr Pwr
- Rated Mtr Volts
- Rated Excit Freq
- Rated Motor Curr
- Motor Poles
- Rated Mtr Speed
- % No Load Curr
- Stator Leakage X
- Rotor Leakage X
- Stator Resist
- Motor Iron Loss
- Motor Mech Loss
- Ovld Start Level
- Ovld Time Out
- Flux Sat Break
- Flux Sat Slope 1
- Flux Sat Slope 2

15.2. HPV600 DETAILLED MENU:

ADJUST A0 MENU → DRIVE A1

FNCT. #	DESCRIPTION	UNIT	DEFAULT	SITE SETTING
CONTRACT CAR SPD	Elevator contract speed	fpm or m/s		
CONTRACT MTR SPD	Motor speed at elevator contract speed	rpm		
RESPONSE	Sensitivity of the speed regulator	rad/sec	10.0	
INERTIA	System inertia	sec	1.2	
INNER LOOP XOVER	Inner speed loop crossover frequency (only with Ereg speed regulator)	rad/sec	2.0	
GAIN REDUCE MULT	Percentage of response of the speed regulator used when in the low gain mode	%	70	
GAIN CHNG LEVEL	Speed level to change to low gain mode (only with internal gain switch)	% rated speed	7.0	
TACH RATE GAIN	Helps with the effects of rope resonance	%	0.0	
SPD PHASE MARGIN	Sets phase margin of speed regulator (only with PI speed regulator)	degrees	80	
RAMPED STOP TIME	Time to ramp torque from rated torque to zero (only with torque ramp down stop function)	seconds	0.2	
CONTACT FLT TIME	Time before a contactor fault is declared	seconds	0.5	
BRAKE PICK TIME	Time before a brake pick fault is declared	seconds	1.00	
BRAKE HOLD TIME	Time before a brake hold fault is declared	seconds	0.20	
OVERSPEED LEVEL	Threshold for detection of overspeed fault	%contract spd	115	
OVERSPEED TIME	Time before a overspeed fault is declared when above the defined overspeed level	Seconds	0.80	
OVERSPEED MULT	Multiplier for overspeed test	%	100	
ENCODER PULSES	Encoder counts per revolution	None	1024	
SPD DEV LO LEVEL	Range around the speed reference for speed deviation low logic output	%contract spd	20.0	
SPD DEV TIME	Time before speed deviation low logic output is true	Seconds	0.90	
SPD DEV HI LEVEL	Level for declaring speed deviation alarm	% contract spd	35.0	
SPD COMMAND BIAS	Subtracts an effective voltage to actual speed command voltage	Volts	0.00	
SPD COMMAND MULT	Scales analog pre-torque command	None	1.00	
PRE TORQUE BIAS	Subtracts an effective voltage to actual pre-torque command voltage	Volts	1.00	
PRE TORQUE MULT	Scales analog speed command	None	1.5	
ZERO SPEED LEVEL	Threshold for zero speed logic output	% contract spd	1.00	
ZERO SPEED TIME	Time before zero speed logic output is declared true	Seconds	0.20	
UP/DWN THRESHOLD	Threshold for detection of up or down direction	% contract spd	1.00	
MTR TORQUE LIMIT	Motoring torque limit	% rated torque	250.0	
REGEN TORQ LIMIT	Regenerating torque limit	% rated torque	250.0	
FLUX WKN FACTOR	Defines the torque limit at higher speeds	%torque	70	
ANA OUT 1 OFFSET	Subtracts an effective voltage to actual analog output 1	%	0.00	
ANA OUT 2 OFFSET	Subtracts an effective voltage to actual analog output 2	%	0.00	
ANA OUT 1 GAIN	Scaling factor for analog output 1	None	1.0	
ANA OUT 2 GAIN	Scaling factor for analog output 2	None	1.0	
FLT RESET DELAY	Time before a fault is automatically reset	Seconds	5	
FLT RESETS/HOUR	Number of faults that is allowed to be automatically reset per hour	Faults	3	
UP TO SPD LEVEL	Threshold for up to spd logic output	% contract spd	80.0	

FNCT. #	DESCRIPTION	UNIT	DEFAULT	SITE SETTING
MAINS DIP SPEED	Multiplier for contract speed when in "low voltage" mode	%	25.00	
RUN DELAY TIMER	Allows the user to delay the drive's recognition of the RUN signal	seconds	0.00	
AB ZERO SPD LEV	Sets the speed point that will be considered as zero speed for the auto brake function	%	0.00	
AB OFF DELAY	Determines the time after zero speed is that the Auto Brake logic output goes false	seconds	0.00	
CONTACTOR DO DLY	Allows the user to delay the drive's dropout of the motor contactor	seconds	0.00	
TRQ LIM MSG DLY	Determines the amount of time the drive is in torque limit before the alarm message is displayed	seconds	1.50	
SER2 INSP SPD	Defines the serial mode 2 inspection speed (only serial mode 2)	FPM or m/sec	30.0 0.150	
SER2 RS CPR SPD	Defines the creep speed that will be used in the "rescue mode" (only serial mode 2)	FPM or m/sec	10.0 0.050	
SER2 RS CPR TIME	Defines the maximum time the drive will continue to run at rescue creep speed (only serial mode 2)	seconds	180.0	
SER2 FLT TOL	Defines the maximum time that may elapse between valid run time messages before a serial fault is declared (only serial mode 2)	seconds	0.04	
ROLLBACK GAIN	Anti-rollback gain	none	1	
NOTCH FILTER FRQ	Notch filter center frequency	Hz	20	
NOTCH FILT DEPTH	Notch filter maximum attenuation	%	0	
MSPD DELAY 1-4	Determines the recognition time delay for a defined multi-step speed command	seconds	0.000	

ADJUST A0 MENU → S-CURVE A2

FNCT. #	DESCRIPTION	UNIT	DEFAULT	SITE SETTING
ACCEL RATE 0	Acceleration rate limit	ft/s2 or m/s2	2.20	
DECEL RATE 0	Deceleration rate limit	ft/s2 or m/s2	2.20	
ACCEL JERK IN 0	Rate of increase of acceleration, up to ACCEL RATE, when increasing elevator speed	ft/s3 or m/s3	8.00	
ACCEL JERK OUT 0	Rate of decrease of acceleration to zero when approaching contract elevator speed	ft/s3 or m/s3	8.00	
DECEL JERK IN 0	Rate of increase of deceleration, up to DECEL RATE, when decreasing elevator speed	ft/s3 or m/s3	8.00	
DECEL JERK OUT 0	Rate of decrease of deceleration to zero when slowing the elevator to levelling speed	ft/s3 or m/s3	8.00	
ACCEL RATE 1	Acceleration rate limit	ft/s2 or m/s2	0.30	
DECEL RATE 1	Deceleration rate limit	ft/s2 or m/s2	2.00	
ACCEL JERK IN 1	Rate of increase of acceleration, up to ACCEL RATE, when increasing elevator speed	ft/s3 or m/s3	8.00	
ACCEL JERK OUT 1	Rate of decrease of acceleration to zero when approaching contract elevator speed	ft/s3 or m/s3	8.00	
DECEL JERK IN 1	Rate of increase of deceleration, up to DECEL RATE, when decreasing elevator speed	ft/s3 or m/s3	8.00	
DECEL JERK OUT 1	Rate of decrease of deceleration to zero when slowing the elevator to levelling speed	ft/s3 or m/s3	8.00	
ACCEL RATE 2	Acceleration rate limit	ft/s2 or m/s2	2.20	
DECEL RATE 2	Deceleration rate limit	ft/s2 or m/s2	2.20	

FNCT. #	DESCRIPTION	UNIT	DEFAULT	SITE SETTING
ACCEL JERK IN 2	Rate of increase of acceleration, up to ACCEL RATE, when increasing elevator speed	ft/s3 or m/s3	8.00	
ACCEL JERK OUT 2	Rate of decrease of acceleration to zero when approaching contract elevator speed	ft/s3 or m/s3	8.00	
DECEL JERK IN 2	Rate of increase of deceleration, up to DECEL RATE, when decreasing elevator speed	ft/s3 or m/s3	8.00	
DECEL JERK OUT 2	Rate of decrease of deceleration to zero when slowing the elevator to levelling speed	ft/s3 or m/s3	8.00	
ACCEL RATE 3	Acceleration rate limit	ft/s2 or m/s2	3.00	
DECEL RATE 3	Deceleration rate limit	ft/s2 or m/s2	3.00	
ACCEL JERK IN 3	Rate of increase of acceleration, up to ACCEL RATE, when increasing elevator speed	ft/s3 or m/s3	8.00	
ACCEL JERK OUT 3	Rate of decrease of acceleration to zero when approaching contract elevator speed	ft/s3 or m/s3	8.00	
DECEL JERK IN 3	Rate of increase of deceleration, up to DECEL RATE, when decreasing elevator speed	ft/s3 or m/s3	8.00	
DECEL JERK OUT 3	Rate of decrease of deceleration to zero when slowing the elevator to levelling speed	ft/s3 or m/s3	8.00	

ADJUST A0 MENU → MULTI-STEP REF A3

FNCT. #	DESCRIPTION	UNIT	DEFAULT	SITE SETTING
SPEED COMMAND 1	Multi-step speed command #1	FPM OR M/SEC	7	
SPEED COMMAND 2	Multi-step speed command #2	FPM OR M/SEC	30	
SPEED COMMAND 3	Multi-step speed command #3	FPM OR M/SEC	60	
SPEED COMMAND 4	Multi-step speed command #4	FPM OR M/SEC	0	
SPEED COMMAND 5	Multi-step speed command #5	FPM OR M/SEC	1 floor run speed	
SPEED COMMAND 6	Multi-step speed command #6	FPM OR M/SEC	Contract speed	
SPEED COMMAND 7	Multi-step speed command #7	FPM OR M/SEC	0	
SPEED COMMAND 8	Multi-step speed command #8	FPM OR M/SEC	0	
SPEED COMMAND 9	Multi-step speed command #9	FPM OR M/SEC	0	
SPEED COMMAND 10	Multi-step speed command #10	FPM OR M/SEC	0	
SPEED COMMAND 11	Multi-step speed command #11	FPM OR M/SEC	0	
SPEED COMMAND 12	Multi-step speed command #12	FPM OR M/SEC	0	
SPEED COMMAND 13	Multi-step speed command #13	FPM OR M/SEC	0	
SPEED COMMAND 14	Multi-step speed command #14	FPM OR M/SEC	0	
SPEED COMMAND 15	Multi-step speed command #15	FPM OR M/SEC	0	

ADJUST A0 MENU → POWER CONVERT A4

FNCT. #	DESCRIPTION	UNIT	DEFAULT	SITE SETTING
Id REG DIFF GAIN	Flux current regulator differential gain	none	1.00	
Id REG PROP GAIN	Flux current regulator proportional gain	none	0.30	
Iq REG DIFF GAIN	Torque current regulator differential gain	none	1.00	
Iq REG PROP GAIN	Torque current regulator proportional gain	none	0.30	
PWM FREQUENCY	Carrier frequency	KHz	10.0	
UV ALARM LEVEL	Voltage level for undervoltage alarm	%nominal bus	80	
UV FAULT LEVEL	Voltage level for undervoltage fault	%nominal bus	70	
EXTERN REACTANCE	External choke reactance	% base Z	0.0	
INPUT L-L VOLTS	Nominal line-line AC input Voltage, RMS	volts	460 OR 230	

ADJUST A0 MENU → MOTOR A5

FNCT. #	DESCRIPTION	UNIT	DEFAULT	SITE SETTING
MOTOR ID	Motor Identification	none	Per ID	
RATED MTR POWER	Rated motor output power	HP or KW	Per ID	
RATED MTR VOLTS	Rated motor terminal RMS voltage	Volts	Per ID	
RATED EXCIT FREQ	Rated excitation frequency	Hz	Per ID	
RATED MOTOR CURR	Rated motor current	Amps	Per ID	
MOTOR POLES	Motor poles	none	Per ID	
RATED MTR SPEED	Rated motor speed at full load	RPM	Per ID	
% NO LOAD CURR	Percent no load current	% rated motor	Per ID	
STATOR LEAKAGE X	Stator leakage reactance	% base Z	Per ID	
ROTOR LEAKAGE X	Rotor leakage reactance	% base Z	Per ID	
STATOR RESIST	Stator resistance	% base Z	Per ID	
MOTOR IRON LOSS	Iron loss at rated frequency	% rated power	Per ID	
MOTOR MECH LOSS	Mechanical loss at rated frequency	% rated power	Per ID	
OVLD START LEVEL	Maximum continuous motor current	% rated crrrent	Per ID	
OVLD TIME OUT	Time that defines motor overload curve	seconds	Per ID	
FLUX SAT BREAK	Flux saturation curve slope change point	% FLUX	Per ID	
FLUX SAT SLOPE 1	Flux saturation curve slope for low fluxes	PU slope	Per ID	
FLUX SAT SLOPE 2	Flux saturation curve slope for high fluxes	PU slope	Per ID	

CONFIGURE C0 MENU → USER SWITCHES C1

FNCT. #	DESCRIPTION	DEFAULT	CHOICES	SITE SETTING
SPD COMMAND SRC	Speed Command Source	MULTI-STEP	analog input multi-step serial ser mult step	
RUN COMMAND SRC	Run Command Source	EXTERNAL TB	external tb serial serial+extrn	
HI/LO GAIN SRC	High / low gain change switch source	INTERNAL	external tb serial internal	
SPEED REG TYPE	Chooses speed regulator: Ereg of PI regulator	ELEV SPD REG	elev spd reg pi speed reg external reg	

FNCT. #	DESCRIPTION	DEFAULT	CHOICES	SITE SETTING
MOTOR ROTATION	Allows user to reverse direction of motor rotation	FORWARD	forward reverse	
SPD REF RELEASE	Determines when speed reference release is asserted (for use when the drive controls the mechanical brake)	REG RELEASE	reg release brake picked	
CONT CONFIRM SRC	Determines if an external logic input is used for contactor confirm	NONE	none external tb	
PRE TORQUE SOURCE	Determines if a pre torque command is used and if used, it determines the source of the pre torque command	ANALOG INPUT	none analog input serial	
PRE TORQUE LATCH	Chooses if analog pre-torque command is latched	NOT LATCHED	latched not latched	
PTORQ LATCH CLCK	Determines source of pre torque latch control (if used)	NONE	none external tb1	
FAULT RESET SRC	Fault reset source	EXTERNAL TB	external tb serial automatic	
OVERSPD TEST SRC	Determines external logic source to initiate overspeed test	EXTERNAL TB	external tb serial	
BRAKE PICK SRC	Determines the source of the brake pick command (if drive controls mechanical brake)	INTERNAL	Internal serial	
BRAKE PICK CNFM	Determines if a logic input is used for brake pick confirm	NONE	none external tb	
BRAKE HOLD SRC	Determines the source of the brake hold command. (if drive controls mechanical brake)	INTERNAL	internal serial	
RAMPED STOP SEL	Chooses between normal stop and torque ramp down stop	NONE	none ramp on stop	
RAMP DOWN EN SRC	Determines the source that signals the torque ramp down stop (if used)	EXTERNAL TB	external tb run logic serial	
BRK PICK FLT ENA	Brake pick fault enable (if drive controls mechanical brake)	DISABLE	disable enable	
BRK HOLD FLT ENA	Brake hold fault enable (if drive controls mechanical brake)	DISABLE	disable enable	
EX HOLD FLT ENA	Sets source of external torque command	NONE	none serial	
DIR CONFIRM	Allows confirmation of polarity of analog speed command	DISABLED	disabled enabled	
S-CURVE ABORT	Addresses handling of a speed command change before S-Curve target speed	ENABLED	disabled enabled	
FAST FLUX	Addresses the method the HPV 900 uses to build up flux in the motor	DISABLED	disabled enabled	
MAINS DIP ENA	Mains Dip function enable	DISABLE	disable enable	
DB PROTECTION	Dynamic braking protection fault or alarm selection	FAULT	fault alarm	
ENCODER FAULT	Allows the user to temporarily disable the Encoder Fault	ENABLE	disable enable	
STOPPING MODE	Determines the multi-step stopping mode	IMMEDIATE	immediate ramp to stop	
AUTO STOP	Auto Stop function enable	DISABLE	disable enable	

FNCT. #	DESCRIPTION	DEFAULT	CHOICES	SITE SETTING
SERIAL MODE	Serial protocol selection	NONE	mode 1 mode 2 mode 2 test	
SER2 FLT MODE	Defines the reaction to a serial communications fault while in Serial Mode 2 (only serial mode 2)	IMMEDIATE	immediate run remove rescue	
DRV FAST DISABLE	Addresses how fast the drive responses to the removal of DRIVE ENABLE logic input	DISABLE	disable enable	

CONFIGURE C0 MENU → LOGIC INPUTS C2

FNCT. #	DESCRIPTION	DEFAULT	SITE SETTING
LOGIC INPUT 1	logic input #1	DRIVE ENABLE	
LOGIC INPUT 2	logic input #2	S-CURVE SEL 1	
LOGIC INPUT 3	logic input #3	RUN UP	
LOGIC INPUT 4	logic input #4	RUN DOWN	
LOGIC INPUT 5	logic input #5	S-CURVE SEL 0	
LOGIC INPUT 6	logic input #6	STEP REF B0	
LOGIC INPUT 7	logic input #7	STEP REF B1	
LOGIC INPUT 8	logic input #8	STEP REF B2	
LOGIC INPUT 9	logic input #9	FAULT RESET	
Choices			
contact cfirm	Auxiliary contacts from motor contactor.		
drive enable	Must be asserted to permit drive to run. This does not initiate run, just permits initiation.		
extrn fault 1	User input fault #1		
extrn fault 2	User input fault #2		
extrn fault 3	User input fault #3		
extrn /flt 4	User input fault #4		
fault reset	Asserting this input attempts to reset faults.		
low gain sel	Low gain for the speed regulator is chosen when this input is asserted.		
mech brake hold	Auxiliary contacts from mechanical brake. Asserted when brake is in hold mode		
mech brake pick	Auxiliary contacts from mechanical brake. Asserted when brake is picked (lifted).		
no function	Input not assigned.		
ospd test src	Asserting this input attempts to reset faults.		
pre-trq latch	Transition from false to true latches pre torque command.		
Run	If drive is enabled through the DRIVE ENABLE logic input, this function will start drive operation.		
run down	If drive is enabled through the DRIVE ENABLE logic input, this function will start drive operation with positive speed commands.		
run up	If drive is enabled through the DRIVE ENABLE logic input, this function will start drive operation with positive speed commands.		
s-curve sel 0	Bit 0 of S-curve selection		
s-curve sel 1	Bit 1 of S-curve selection		
ser2 insp ena	Defines one of the two sources of inspection run command (only serial mode 2)		
step ref b0	Bit 0 of multi-step speed command selection		
step ref b1	Bit 1 of multi-step speed command selection		
step ref b2	Bit 2 of multi-step speed command selection		
step ref b3	Bit 3 of multi-step speed command selection		
trq ramp down	Asserting this ramps torque output to zero at “Ramped Stop Time parameter” rate.		

FNCT. #	DESCRIPTION	DEFAULT	SITE SETTING
up/dwn	This logic can be used to change the sign of the speed command. False = no inversion, true = inverted.		

CONFIGURE C0 MENU → LOGIC OUTPUTS C3

FNCT. #	DESCRIPTION	DEFAULT	SITE SETTING
LOGIC OUTPUT 1	logic output #1	MOTOR OVERLOAD	
LOGIC OUTPUT 2	logic output #2	RUN CONFIRM	
LOGIC OUTPUT 3	logic output #3	NO FUNCTION	
LOGIC OUTPUT 4	logic output #4	NO FUNCTION	
RELAY COIL 1	relay output #1	SPEED DEV LOW	
RELAY COIL 2	relay output #2	READY TO RUN	
Choices			
Alarm	An alarm declared by the drive		
alarm + flt	A fault or alarm is declared by the drive		
auto brake	Signal used to pick (open) the mechanical brake via Auto Brake function (only multi-step speed commands)		
brake alarm	A brake fault is declared while the drive is running		
brake hold	The brake pick confirmation is received		
brake pick	Signal used to pick (open) the mechanical brake		
brk hold flt	Brake hold state has not matched the commanded state		
brk igbt flt	Brake IGBT has reached overcurrent		
brk pick flt	Brake pick stat has not matched the commanded state		
car going dwn	The motor is moving in negative direction faster than user specified speed		
car going up	The motor is moving in positive direction faster than user specified speed		
charge fault	DC bus has not charged		
close contact	The drive has been enabled & commanded to run and no faults are present		
contactor flt	Contactor state has not matched the commanded state		
curr ref flt	The actual current measurement does not match commanded current		
drv overload	The drive has exceeded the drive overload curve		
encoder flt	Encoder is disconnected or not functioning, while attempting to run		
fan alarm	Cooling fan failure		
Fault	A fault declared by the drive		
flux confirm	The drive's estimate of flux has reached 75% of reference		
ffse fault	DC bus fuse is open		
fround fault	Sum of all phase currents exceeds 50% of rated current		
In low gain	Low gain or response is now being used by the speed regulator		
motor trq lim	The drive has exceeded the motoring torque limit		
mtr overload	The motor has exceeded the motor overload curve		
no function	Output not assigned		
not alarm	The output is true when an alarm is NOT present		
over curr flt	Phase current exceeded 300%		
overspeed flt	The drive has exceeded the overspeed leved		
overtemp flt	Heatsink temperature exceeded 90°C (194°F)		
overvolt flt	DC bus voltage exceeded 850VDC for 460V drive or 425 VDC for 230V drive		
ovrtemp alarm	Heatsink temperature exceeded 80°C (176°F)		
phase fault	Open motor phase		
ramp down ena	Indicates the torque is being ramped to zero		
ready to run	The drive's software has initialized and no fault are present		
regen trq lim	The drive has exceeded the regenerating torque limit		
run commanded	The drive is being commanded to run		

FNCT. #	DESCRIPTION	DEFAULT	SITE SETTING
run confirm	The drive has been enabled & commanded to run; no faults are present; the contactor has closed and the IGBT s are firing		
speed dev	The speed feedback is failing to properly track the speed reference		
speed dev low	The speed feedback is properly tracking the speed reference		
speed ref rls	Flux is confirmed and drive is NOT in DC injection		
speed reg rls	Flux is confirmed and brake is commanded to be picked (if used)		
undervolt flt	DC bus voltage has dropped bellow a specified percent		
up to speed	The motor speed is above a user defined level		
uv alarm	DC bus voltage has dropped below a specified percent		
zero speed	The motor speed is bellow a user defined level		

CONFIGURE C0 MENU → ANALOG OUTPUTS C4

FNCT. #	DESCRIPTION	DEFAULT	SITE SETTING
ANALOG OUTPUT 1	analog output #1	SPEED REF	
ANALOG OUTPUT 2	analog output #2	speed FEEDBK	
Choices			
aux torq cmd	Additional torque command from auxiliary source		
bus voltage	Measured DC bus voltage		
current out	Percent motor current		
drv overload	Percent of drive overload trip level reached		
flux current	Measured flux producing current		
flux output	Measured flux output		
flux ref	Flux reference used by vector control		
flux voltage	Flux producing voltage		
frequency out	Electrical frequency		
mtr overload	Percent of motor overload trip level reached		
power output	Calculated power output		
pretorque ref	Pre-torque reference		
slip freq	Commanded slip frequency		
spd rg tq cmd	Torque command from speed regulator		
speed command	Speed command before S-Curve		
speed error	Speed reference minus speed feedback		
speed feedbk	Speed feedback used by speed regulator		
speed ref	Speed reference after S-Curve		
tach rate cmd	Torque command from tach rate gain function		
torq current	Measured torque producing current		
torq voltage	Torque producing voltage		
torque output	Calculated torque output		
torque ref	Torque reference used by vector control		
voltage out	RMS motor terminal voltage		

DISPLAY D0 MENU → ELEVATOR DATA D1

FNCT. #	DESCRIPTION	UNIT	DEFAULT	SITE SETTING
SPEED COMMAND	Speed command before speed reference generator	fpm or m/s		
SPEED REFERENCE	Speed reference after speed reference generator	fpm or m/s		
SPEED FEEDBACK	Encoder feedback used by speed regulator	fpm or m/s		
SPEED ERROR	Speed reference minus speed feedback	fpm or m/s		

FNCT. #	DESCRIPTION	UNIT	DEFAULT	SITE SETTING
PRE-TORQUE REF	Pre-torque reference	% RATED TORQUE		
SPD REG TORQ CMD	Torque command from speed regulator	% RATED TORQUE		
TACH RATE CMD	Torque command after tach rate gain function	% RATED TORQUE		
AUX TORQUE CMD	Feedforward torque command from auxiliary source	% RATED TORQUE		
EST INERTIA	Estimated elevator system inertia	SECONDS		
LOGIC OUTPUTS	Shows condition of logic outputs	1=T 0=F		
LOGIC INPUTS	Shows condition of logic inputs	1=T 0=F		

DISPLAY D0 MENU → POWER DATA D2

FNCT. #	DESCRIPTION	UNIT	DEFAULT	SITE SETTING
TORQUE REFERENCE	Torque reference used by vector control	% rated torque		
MOTOR CURRENT	RMS motor current	Amps		
% MOTOR CURRENT	Percent motor current	% rated current		
MOTOR VOLTAGE	RMS motor terminal voltage	Volts		
MOTOR FREQUENCY	Electrical frequency output	Hz		
MOTOR TORQUE	Calculated motor torque output	% rated torque		
POWER OUTPUT	Calculated drive power output	KW		
DC BUS VOLTAGE	Measured DC bus voltage	Vplts		
FLUX REFERENCE	Flux reference used by vector control	% rated flux		
FLUX OUTPUT	Measured flux output	% rated flux		
SLIP FREQUENCY	Commanded slip frequency	Hz		
MOTOR OVERLOAD	Percent of motor overload trip level reached	%		
DRIVE OVERLOAD	Percent of drive overload trip level reached	%		
FLUX CURRENT	Measured flux producing current	% rated current		
TORQUE CURRENT	Measured torque producing current	% rated current		
FLUX VOLTAGE	Flux voltage reference	% rated volts		
TORQUE VOLTAGE	Torque voltage reference	% rated volts		
BASE IMPEDANCE	Drive calculated base impedance	Ohms		
EST NO LOAD CURR	Estimated no load current	% rated current		
EST RATED RPM	Estimated rated RPM	RPM		

UTILITY U0 MENU → PASSWORD U1

FNCT. #	DESCRIPTION	CHOICES	DEFAULT	SITE SETTING
ENTER PASSWORD	Allows the user to enter in a password		012345	
NEW PASSWORD	Used to change the established password			
PASSWORD LOCKOUT	Used to enable and disable password lockout	disabled enabled	DISABLED	

UTILITY U0 MENU → HIDDEN ITEMS U2

FNCT. #	DESCRIPTION	CHOICES	DEFAULT	SITE SETTING
HIDDEN ITEMS	Selects if the "hidden" parameters will be displayed on the Digital Operator	disabled enabled	ENABLED	

UTILITY U0 MENU → UNITS U3

FNCT. #	DESCRIPTION	CHOICES	DEFAULT	SITE SETTING
UNITS	Choose either metric units or standard English measurements units		ENGLISH	

UTILITY U0 MENU → OVERSPEED TEST U4

FNCT. #	DESCRIPTION	CHOICES	DEFAULT	SITE SETTING
OVERSPEED TEST	Allows for Overspeed Test to be enabled via the digital operator	no yes	NO	

UTILITY U0 MENU → RESTORE DEFAULTS U5

FNCT. #	DESCRIPTION	CHOICES	DEFAULT	SITE SETTING
DRIVE DEFAUTLS	Resets all parameters to there default values except parameters in MOTOR A5			
MOTOR DEFAULTS	Resets the parameters in the MOTOR A5 to the defaults defined b the MOTOR ID			

UTILITY U0 MENU → DRIVE INFO U6

FNCT. #	DESCRIPTION	CHOICES	DEFAULT	SITE SETTING
DRIVE VERSION	Shows the software version of the drive software			
BOOT VERSION	Shows the lower level software version of the drive			
CUBE ID	Displays the cube identification number of the drive			

FAULT F0 MENU → ACTIVE FAULTS F1

FNCT. #	DESCRIPTION	UNIT	DEFAULT	SITE SETTING
DISPLAY ACTIVE FAULTS	Contains a list of up to the last sixteen faults			
RESET ACTIVE FAULTS	Allows for reset of active faults			

FAULT F0 MENU → FAULT HISTORY F2

FNCT. #	DESCRIPTION	UNIT	DEFAULT	SITE SETTING
DISPLAY FAULT HISTORY	Contains a list of up to the last sixteen faults			
CLEAR FAULT HISTORY	Allows for the clearing of the fault history			

16. DRIVE CONTROL TECHNIQUES SP (MENU PARAMETERS 0):

Menu 0	Description	Parameters	Value
0,01	Minimum reference clamp (minimum motor speed =0)	1,07	
0,02	Maximum reference clamp (maximum motor speed)	1,06	
0,03	Acceleration rate 1 (for one floor run)	2,11	
0,04	Deceleration rate 1 (for one floor run)	2,21	
0,05	Reference select (preset or analog speed)	1,14	
0,06	Current Limit	4,07	
0,07	Speed controller P gain 1 (Kp1) (speed gain)	3,10	
0,08	Speed controller I gain 1 (Ki1) (speed gain)	3,11	
0,09	Speed controller D gain 1 (Kd1) (speed gain)	3,12	
0,10	Motor speed (speed feedback)	3,02	
0,11	Frequency/speed reference selected (requested speed)	1,01	
0,12	Total Motor Current (actual motor current)	4,01	
0,13	Active motor current	4,02	
0,14			
0,15			
0,16	Acceleration rate 2 (for inspection speed)	2,12	
0,17	Deceleration rate 2 (for inspection speed)	2,22	
0,18	Acceleration rate 3 (for 2 floors run)	2,13	
0,19	Deceleration rate 3 (for 2 floors run)	2,23	
0,20	Pre-set ref 1 (electrical zero)	1,21	
0,21	Pre-set ref 2 (leveling speed)	1,22	
0,22	Pre-set ref 3 (inspection controller speed)	1,23	
0,23	Pre-set ref 4 (inspection car top speed)	1,24	
0,24	Pre-set ref 5	1,25	
0,25	Pre-set ref 6 (one floor run speed)	1,26	
0,26	Pre-set ref 7 (Contract speed)	1,27	
0,27	Percentage trim	1,38	
0,28	S ramp acceleration limit	2,07	
0,29	SmartCard parameter data (Num. of last data loaded)	11,36	
0,30	Parameter cloning (allows to save and change smartcard)	11,42	
0,31	Analog reg 1 (speed) (requested speed-analog)	1,36	
0,32			
0,33	Pre-Torque Ref. (% preload torque requested)	4,08	

Menu 0	Description	Parameters	Value
0,34	T7 analog input 2 offset (Torque offset)	7,31	
0,35	Analog input 2	7,02	
0,36	Stator resistance	5,17	
0,37	Transient inductance	5,24	
0,38	Current loop P gain	4,13	
0,39	Current loop I gain	4,14	
0,40	Autotune	5,12	
0,41	Maximum switching frequency	5,18	
0,42	No of motor poles	5,11	
0,43	Rated power factor	5,10	
0,44	Motor rated voltage	5,09	
0,45	Motor rated load rpm / rated speed	5,08	
0,46	Motor rated current	5,07	
0,47	Rated frequency	5,06	
0,48			
0,49	Security Status	11,44	
0,50	Drive encoder type	3,38	
0,51	Drive encoder power supply	3,36	
0,52	Drive encoder position	3,29	
0,53	Drive encoder lines per revolution (Nbr Pulse Encoder)	3,34	
0,54	Speed Deviation Threshold (RPM)	18.11	
0,55	Drive encoder revolution counter	3,28	
0,56			
0,57			
0,58			
0,59	Direction (0=FWD=Clockwise)	18.35	

17. DRIVE CONTROL TECHNIQUES "M" (MENU PARAMETERS 0):

Menu 0	Description	Parameters	Value
0.001	Parameter cloning (SmartCard (Load/Save)	11.042	
0.002	Trip 0 (Last Fault)	10.020	
0.003			
0.004			
0.005	Motoring Current Limit (Torque limit)	4.005	
0.006	Symmetrical Current Limit (Torque limit)	4.007	
0.007	Speed controller P gain 1 (Kp1)	3.010	
0.008	Speed controller I gain 1 (Ki1)	3.011	
0.009	Speed controller D gain 1 (Kd1)	3.012	
0.010	Speed Feedback	3.002	
0.011	Reference selected (Speed selected)	1.001	
0.012	Current Magnitude (Motor Current)	4.001	
0.013	Brake Control: Brake Release (Output RUN)	12.040	
0.014	Acceleration/Decceleration Rate Selected	2.030	
0.015			
0.016			
0.017			
0.018	Reference Selector (# Speed selected)	1.014	
0.019	Maximum Reference Clamp (Maximum speed)	1.006	
0.020	Pre-set ref 1 (Zero speed)	1.021	
0.021	Pre-set ref 2 (Leveling speed)	1.022	
0.022	Pre-set ref 3 (Inspection controller speed)	1.023	
0.023	Pre-set ref 4 (Top car Inspection speed)	1.024	
0.024	Pre-set ref 5	1.025	
0.025	Pre-set ref 6 (1 floor speed)	1.026	
0.026	Pre-set ref 7 (Contract speed)	1.027	
0.027	Pre-set ref 8	1.028	
0.028	Maximum Rate Of Change Of Acceleration (S-Curve)	2.007	
0.029	S Ramp Set-up Mode	2.041	
0.030	Max. Rate Of Change Of Acceleration 1 (Accel. In)	2.042	
0.031	Max. Rate Of Change Of Acceleration 2 (Accel. Out)	2.043	
0.032	Max. Rate Of Change Of Acceleration 3 (Deccel. In)	2.044	
0.033	Max. Rate Of Change Of Acceleration 4 (Deccel. Out)	2.045	

Menu 0	Description	Parameters	Value
0.034	Acceleration Rate 1(1 floor speed)	2.011	
0.035	Deceleration Rate 1 (1 floor speed)	2.021	
0.036	Acceleration Rate 2 (Inspection speed)	2.012	
0.037	Deceleration Rate 2 (Inspection speed)	2.022	
0.038	Acceleration Rate 3 (2 floors speed)	2.013	
0.039	Deceleration Rate 3 (2 floors speed)	2.023	
0.040	Acceleration Rate 4	2.014	
0.041	Deceleration Rate 4	2.024	
0.042			
0.043			
0.044	Maximum Switching Frequency	5.018	
0.045	Auto-tune	5.012	
0.046	Motor Parameter Adaptive Control (For motor slip)	5.016	
0.047	Number Of Motor Poles	5.011	
0.048	Motor Rated RPM	5.008	
0.049	Motor Rated Voltage	5.009	
0.050	Motor Rated Current	5.007	
0.051	Reverse Output Phase Sequence	5.042	
0.052	Current Controller Kp Gain	4.013	
0.053	Current Controller Ki Gain	4.014	
0.054	Overspeed Threshold (0 = Overspeed = 120%)	3.008	
0.055	Speed deviation (RPM)	18.011	
0.056	Motor Thermal Time Constant (Overload time constant)	4.015	
0.057	Motor Protection Accumulator (Output OVLD > 75%)	4.019	
0.058			
0.059			
0.060	Drive encoder type	3.038	
0.061	Drive encoder supply voltage	3.036	
0.062	Drive encoder lines per revolution	3.034	
0.063	Drive encoder position	3.029	
0.064	Position Feedback Phase Angle	3.025	
0.065	RFC Feedback Mode	3.024	
0.066	P1 Error Detection Level	3.040	
0.067	P1 Feedback Reverse (Reverse channel AB)	3.056	

Menu 0	Description	Parameters	Value
0.068			
0.069			
0.070			
0.071			
0.072			
0.073	Analog Reference 1 (Analog speed Posi1000)	1.036	
0.074	Torque Reference	4.008	
0.075	Analog Input 2 Offset (Preload-Torque)	7.031	
0.076	Analog Input 2 Scaling (Preload-Torque)	7.012	
0.077	Analog Input 2 Invert (Preload-Torque)	7.013	
0.078	Analog Input 3 Thermistor Feedback (Moteur Thermistor)	7.047	
0.079	Analog Input 3 Thermistor Trip Threshold	7.048	
0.080	Analog Input 3 Thermistor Reset Threshold	7.049	